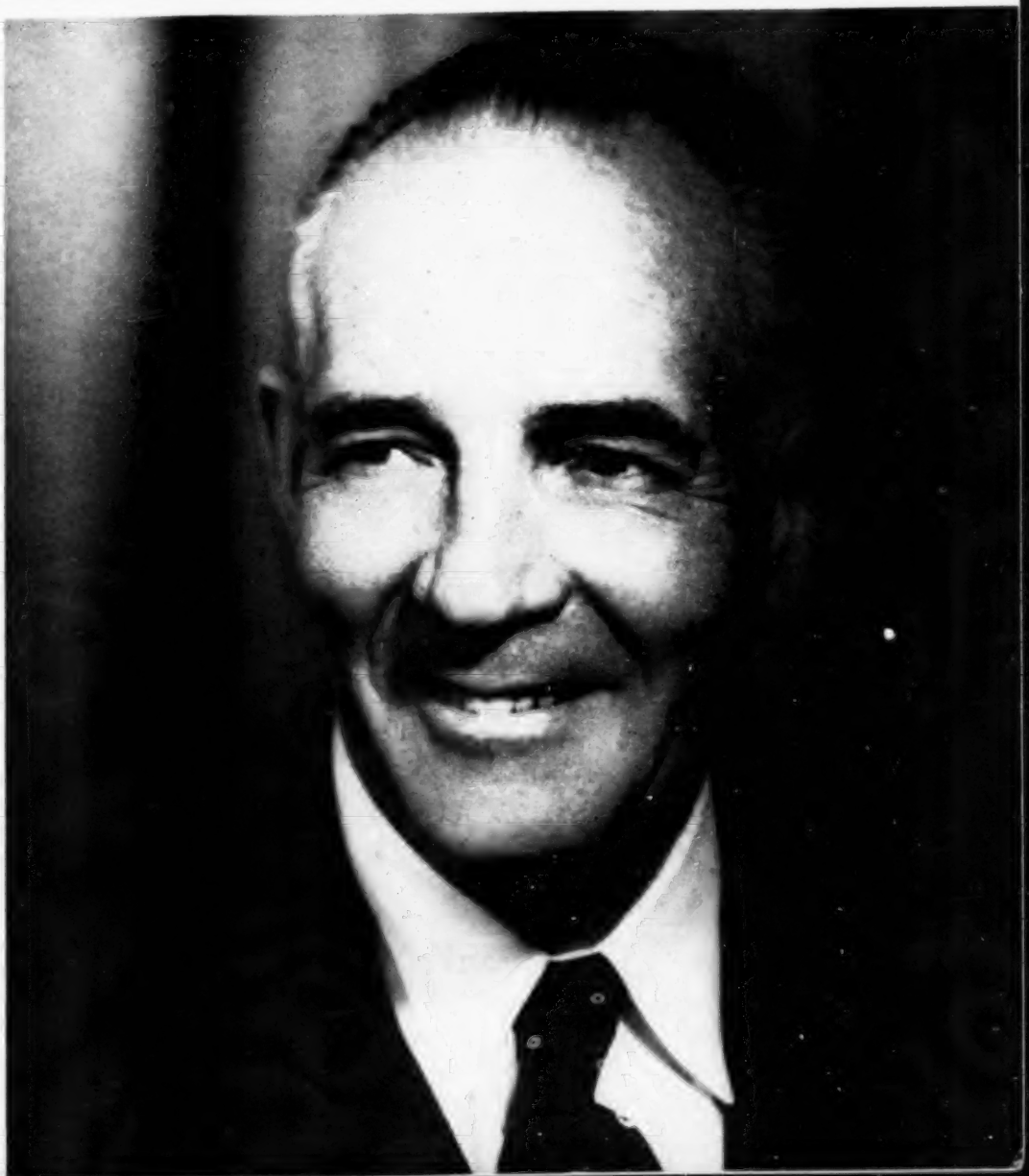
Vol. 8, No. 9

SEPTEMBER, 1953

AGRICULTURAL CHEMICALS

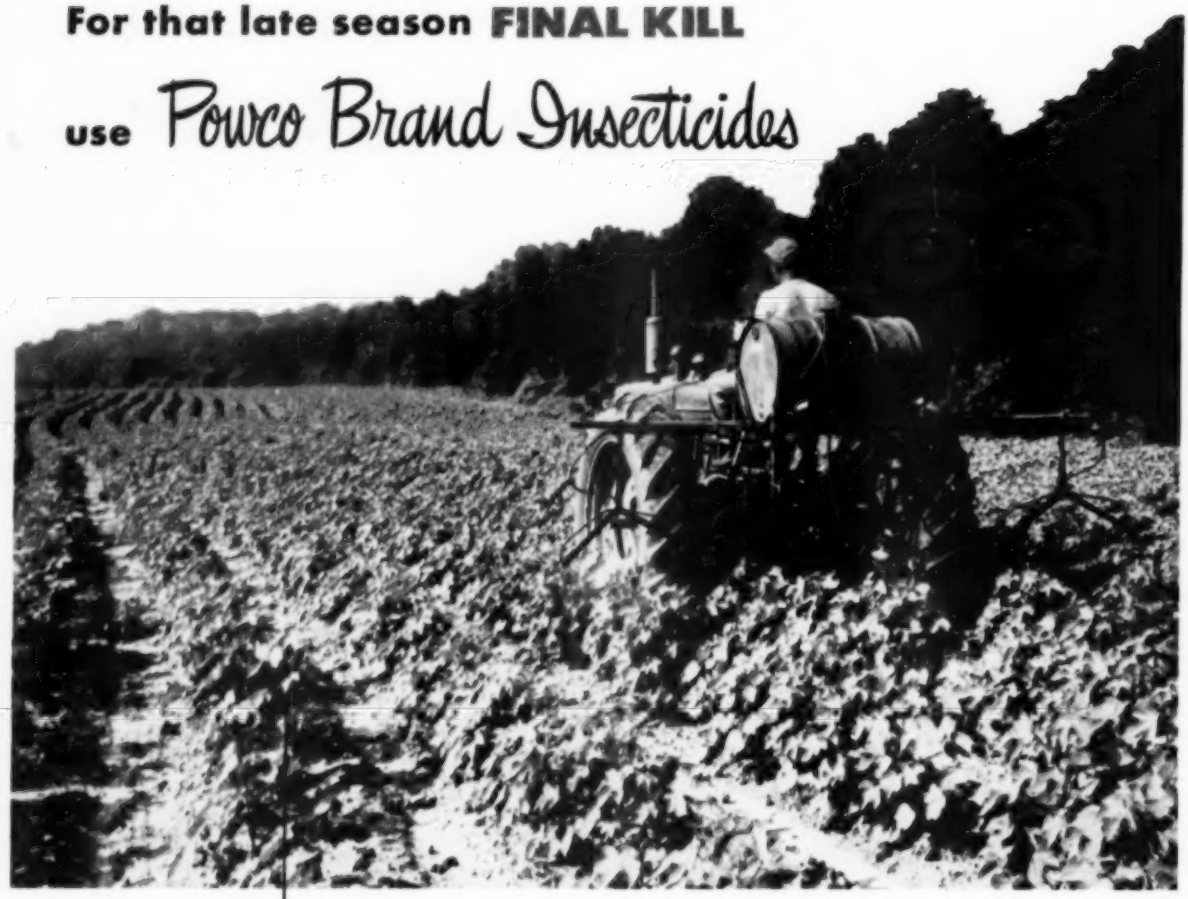
In This Issue:

In the photo: ARTHUR W. McHIE President, NAC Assn. See Page 3



For that late season FINAL KILL

use *Powco Brand Insecticides*



You need insecticides of the highest toxicity and effectiveness for that final defense of crops against late season insect damage.

You get this high toxicity and effectiveness with any POWCO BRAND product — whether it be Pyrethrum, Rotenone or TEPP (tetraethylpyrophosphate) for Fall vegetable crops — or Parathion for cotton.

For the late season — or any season — look to Powell.

John Powell & Co., Inc.

ONE PARK AVENUE, NEW YORK 16, N. Y.

Sales Offices: Philadelphia • Pittsburgh • Chicago • Huntsville • Fort Worth • Omaha • San Francisco • Atlanta

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DDT • TOXAPHENE • BHC • CHLORDANE • LINDANE • ROTENONE • SABADILLA • PYRETHRUM & PYRIN • ANTU
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LOOK TO POWELL...FOR CONSISTENT, TROUBLE-FREE QUALITY

World Necessity

Without fertilizer, the constant high production on our nation's farms would be impossible. Feeding hungry people the world over makes soil improvement a necessity.

The unexcelled red muriate produced by Potash Company of America is a major contribution to the fertilizer industry.

POTASH COMPANY of AMERICA
Carlsbad, New Mexico

General Sales Office . . . 1625 Eye Street, N. W., Washington, D. C.
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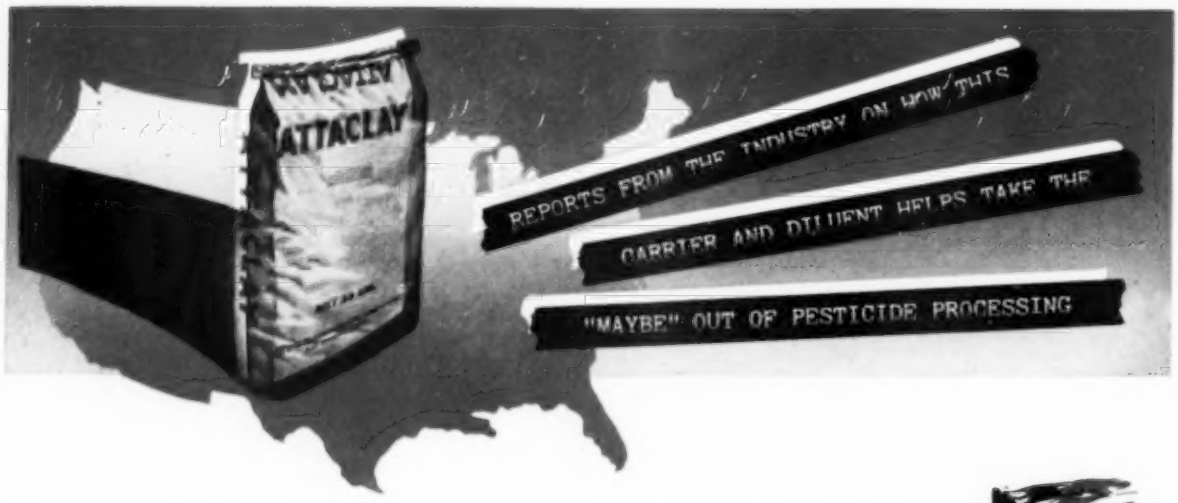

These plants cash in on Attaclay's over-all flexibility and efficiency

LOCATION: Pacific Northwest

PLANT MANAGER: *We make many products, yet inventory only one carrier and diluent—Attaclay. It does so many jobs so well that advantages show up all along the line—from simplified procurement to better finished products.*

LOCATION: South Central U. S.

PRODUCTION SUPERINTENDENT: *There was a time we used several diluents in addition to Attaclay. Then adverse weather left us with a heavy inventory of non-Attaclay DDT and BHC bases that caked on storage, all of which had to be re-worked. This unhappy experience sold us on using Attaclay across the board.*

LOCATION: Mississippi

PLANT MANAGER: *We've standardized on Attaclay for bases and finished dusts. And take my word for it, we have fewer problems in material scheduling and handling—less chance of errors occurring in formulating.*

LOCATION: Pennsylvania

MANAGER: *While our research division insists upon Attaclay for many of our products, we in the manufacturing end of the operation are convinced we can save money by using Attaclay in all dust bases and wettable powders.*

Make Attaclay *your* unified source of greater profits and better products. We'll be glad to work with you.

ATTAPULGUS Minerals & Chemicals Corporation

Dept. P, 210 West Washington Square, Phila. 5, Pa.

SOIL PESTICIDE GRADES *Attapulgus Clay is available in granular grades for the formulation of soil pesticides. Write for samples and data sheet.*

AGRICULTURAL CHEMICALS

THIS MONTH'S COVER:

Arthur W. Mohr, president, NAC Association since September, 1951, is a native Californian; holds chemical engineering degrees from U of C; joined Standard Oil Co. of California after serving in World War I and worked up through sales positions to presidency in 1947, of California Spray-Chemical Corp., wholly-owned subsidiary of Standard Oil.

VOL. 8 No. 9
SEPTEMBER 1953

A Monthly Magazine For the Trade

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Advertising Manager

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In This Issue:

AGRICULTURAL CHEMICALS

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Entered as second-class matter November 4, 1949, at the Post Office at Baltimore, Md., under the Act of March 3, 1879.

CYANOGAS G-FUMIGANT being applied directly to grain stream. CYANOGAS drum adapter and dosage plate regulate the flow automatically and accurately.

Best way to protect stored grain against insect damage...

CYANOGAS® G-FUMIGANT

As harvested grain begins to tax the nation's storage facilities, more and more attention is focused on one problem: how to reduce insect infestation in stored grain.

The most effective way to keep insect populations in stored grain down to a minimum is by fumigation—and CYANOGAS G-Fumigant, with its "automatic" method of handling, is the logical choice. Here's why:

1. It's easy to use—CYANOGAS G-Fumigant is free-flowing . . . ready for use. No weighing, mixing, measuring. Gravity does the work.

2. It's economical—As much as 30,000 bushels per hour can be fumigated at an average cost as low as ¼-cent per bushel . . . less than any other method giving comparable results.

3. It's effective—When CYANOGAS is used at recommended dosages, insect kills approach 100%. Even insect eggs laid in grain berries are killed.

4. It has no injurious effect on milling or baking qualities, when used as directed.

Write for free literature.

AMERICAN Cyanamid COMPANY

AGRICULTURAL CHEMICALS DIVISION

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Producers of:

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PHOSPHATES for Acidulation and Direct Application

MALATHION Insecticides

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HCN Fumigants

ACRYLON® Spot Fumigant

POTASSIUM CYANATE Weedkiller for Agriculture and Turf

AEROTIL® Soil Conditioners

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QUESTION:
"How have you used Multiwall Bags in your merchandising program?"

User: **DRAGON CEMENT CO., Inc., New York, N. Y.**

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The distinctive Dragon design identifies seven major products manufactured by this well-known company in the cement industry.

The familiar design which establishes the family relationship among Dragon products was developed by Dragon Cement personnel in cooperation with the Union Bag Art Department.

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UNION BAG & PAPER CORPORATION • WOOLWORTH BUILDING, NEW YORK 7, N. Y.

for high Kill through Better Coverage

there's nothing like
Low Cost
Nacconol*
as the wetting agent in insecticidal, fungicidal and herbicidal sprays

It costs little but it does a lot to improve the emulsifying, spreading and sticking properties of sprays. As little as ¼ % to 2,4-D; Chlordane, Sulfur and similar products and mixtures. Results are instantly observable: Better coverage, uniform wetting and higher kill.

Powder, flake or bead form—all rapidly soluble in cold water, at any pH. Now is the time to line up your 1954 needs. Phone our nearest office for samples, prices and suggestions on formulation...

NATIONAL ANILINE DIVISION
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40 RECTOR STREET, NEW YORK 6, N.Y.

Allied Chemical

COLUMBIA-SOUTHERN

BHC

Benzene Hexachloride . . . for manufacturing use only

are you keeping your eyes on new developments in **BHC** and **CHLORO-IPC?**

COLUMBIA-SOUTHERN

CHLORO-IPC

Isopropyl N (3-Chlorophenyl) Carbamate . . . for manufacturing use only

ARE YOU CAPITALIZING ON THE USES FOR BHC?

The many uses already established for BHC, and further uses now under test, open vast new markets and profit opportunities to manufacturers of BHC dust or spray concentrates.

1. SPITTLEBUGS IN FIELD CROPS. Experiments have shown that in combating spittlebugs, BHC has increased the yield of field legumes. BHC's speed of kill reduces plant injury from bugs, leafhoppers and thrips. Early spring treatment is normally prescribed.

2. AMBROSIA BEETLES IN LOGS AND LUMBER. When these pests burrow under the bark, various stains frequently develop in the wood. Because of BHC's speed of kill, a promising market exists in uncut timber or cut logs. Spray treatment is normally recommended.

3. SPRAY FORMULATIONS. There is a steadily increasing use of liquid emulsifiable concentrates which employ Columbia-Southern's 40% technical BHC for higher concentrations and greater stability.

4. NURSERIES. Experiments show great acceleration in the rate of sapling growth when BHC is added to the soil.

5. HIGH CONCENTRATE DUST BASES WITH HI-SIL. BHC permits dust bases as high as 36% gamma which afford great reductions in shipping and packaging costs. Hi-Sil, another Columbia-Southern product, is widely used in making 75% DDT.

6. ANIMAL ECTOPARASITES. Better control over cattle lice is made possible by both BHC dust and sprays which kill the eggs as well as the adult lice. The growing cattle market indicates a growing BHC market. Outstanding control has been shown for hog mange mite with BHC dust or sprays.

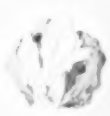
ARE YOU CAPITALIZING ON THESE USES FOR CHLORO-IPC?

Columbia-Southern pioneered in the development and field testing of Chloro-IPC and was first to serve agriculture with this promising herbicide ingredient. During 1953, the first year of unlimited use, every grower reported uniformly excellent results regardless of weather.

1. COTTON Extensive use shows that spray applications of Chloro-IPC can reduce by as much as 75% the labor of hoeing.

2. FIELD LEGUMES. Outstanding weed control has been reported in Middle Atlantic states through the application of 2 to 3 lbs. of Chloro-IPC in mid-winter on alfalfa plantings.

3. EXTENDING POTATO DORMANCY. In U.S. and abroad, Chloro-IPC applications show a highly significant extension of the dormant period in potatoes. Spring sprouting and shrivelling are retarded in stored table stocks.



4. VEGETABLES. Tests show promising results on certain leafy vegetables along the Eastern Seaboard in controlling a wide variety of annual weeds. As little as 4 pound per acre has proved effective under certain conditions.

5. SEED GRASSES. Fall treatments of Chloro-IPC for annual weeds in alta fescue show excellent promise, particularly in the Pacific Northwest.

6. NURSERIES. Chloro-IPC soil applications are reported to permit great increases in sapling growth. This opens a new market.

A copy of our summary giving results of field testing is available upon request. Additional information concerning field and crop residues also can be furnished.

COLUMBIA-SOUTHERN
CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

EXECUTIVE OFFICES:
[illegible]

DISTRICT OFFICES:
[illegible]

Easy-to-handle bag replaces bulky container!

Multi-wall bag, coated with "Alathon" for low moisture transmission, cuts packaging and shipping costs

"Ammate" ammonium sulfamate, a powdered weed killer, was previously packaged in bulky containers which were costly to ship and cumbersome to handle. The problem was to develop a package that would overcome these difficulties . . . and still provide adequate moisture protection for the highly hygroscopic contents.

The problem was solved with a multi-wall paper bag that has a 1½ mil coating of Du Pont "Alathon" polyethylene resin on the inside and an outer ply of 60# wet strength kraft. The 75-pound-capacity bag has waxed seams top and bottom and a valve sleeve which is heat-sealed after the bag is filled. In service for over a year, this new bag has reduced packaging and shipping costs . . . is easier to handle . . . and provides such excellent moisture protection that the weed killer can be stored in humid climates without danger of product deterioration.

Perhaps "Alathon" polyethylene resin—with its unique combination of properties—can help you solve a special problem. "Alathon" is tough and flexible over a wide range of temperatures—from tropical heat to 70° below zero . . . resists most greases, acids and alkalies . . . is tasteless, odorless and non-toxic. Consider using it in multi-ply or single-ply bags, pouch bags, chipboard containers and trays, fiber drums and cartons.

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...THROUGH CHEMISTRY
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DEPARTMENT
PLASTICS • CHEMICALS

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describing the properties and uses of "Alathon" in the packaging field, or simply mail this handy coupon. We'll gladly put you in touch with sources of supply for packaging materials coated with "Alathon."

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Please send me the new booklet on packages using coatings of "Alathon."

Check type of package most interested in: Multi-wall bags ( ), Single ply bags ( ), Pouch bags ( ), Fiber drums & cartons ( ), Chipboard containers & trays ( ), Overwraps ( ), Other ( ).

Name _____

Title _____

Company _____

Address _____

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Phillips supplies NITROGEN in 4 forms

1 AMMONIUM SULFATE

Phillips *66* Ammonium Sulfate is available *now!* It's *dry*-cured to remove excess moisture—prevent caking. Uniform crystals flow freely—mix easily. Contains 21% nitrogen, ideal for all analyses of mixed goods and for direct application to all farm crops. Contact us now for your requirements.

2 ANHYDROUS AMMONIA

Tank car shipments of Anhydrous Ammonia (82% nitrogen) are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle. Write our nearest district office for full information.

3 NITROGEN SOLUTIONS

Get more N per dollar! Phillips *66* Nitrogen Solutions are well suited to the preparation of high-analysis fertilizers and the ammoniation of superphosphate. These three nitrogen solutions keep handling costs low! Promote rapid, thorough curing!

4 AMMONIUM NITRATE

Phillips *66* Prilled Ammonium Nitrate contains 33% nitrogen. The small, coated prills or pellets resist caking . . . handle easily. Depend on Phillips *66* Prilled Ammonium Nitrate for uniform, free-flowing properties and top-notch crop response.

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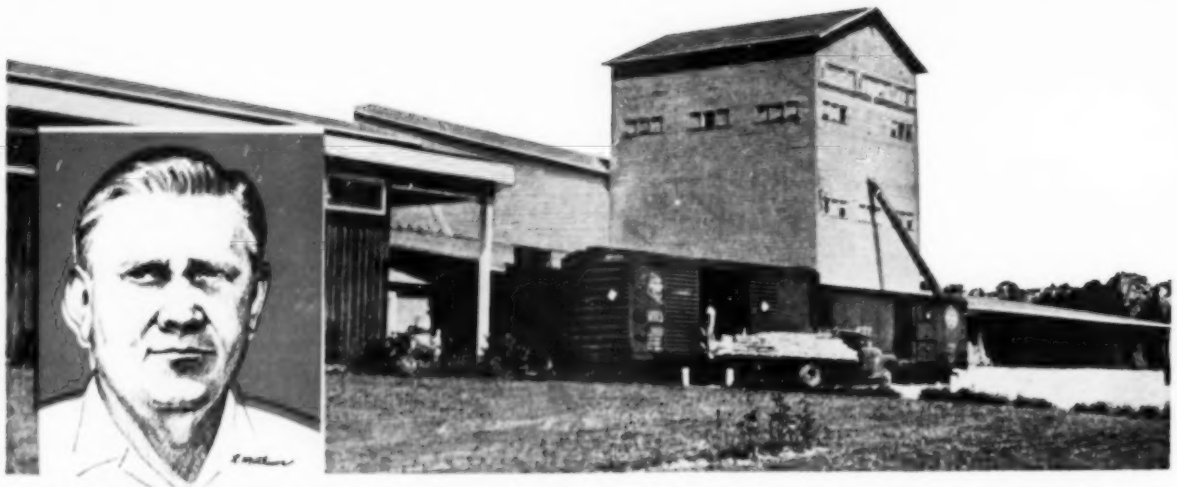
PASADENA, CALIF.—604 Citizens Bank Bldg. • NEW YORK, N. Y.—80 Broadway • BARTLESVILLE, OKLA.—Adams Bldg.



K. M. Mitchell is General Manager, Secretary and Treasurer of Chavala Cooperative, Inc. in Phenix City, Alabama.

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Chavala Cooperative, Inc.

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America's Growing Name in Chemicals

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Michigan Chemical Corporation, prime producer of Pestmaster Methyl Bromide in both cylinders and cans, offers an unusually detailed set of fumigation manuals for your convenience. Whether your interest is in growing, storage, or processing of grain, fruit, meat, dairy products, tobacco, cotton, peanuts, or other foods, you'll find complete instructions and invaluable advice regarding your fumigation needs. Simply indicate your interest on the chart at right and mail today. Your particular manual will be on its way at once.

YOURS ON REQUEST—Unusually complete and explicit fumigation instructions in manual form. Step by step recommendations for a wide range of Methyl Bromide applications, including dosages, equipment and precautionary measures. Indicate the type of application of interest to you on chart below. Pestmaster manual will be sent at once. No obligation.

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- ☐ Packer
- ☐ Warehouser
- ☐ Processor
- ☐ Shipper
- ☐ Manufacturer

CHECK APPLICATIONS OF MOST INTEREST TO YOU

- ☐ Box Cars
- ☐ Cotton Storage
- ☐ Candy
- ☐ Dairy Plants
- ☐ Flour Mills
- ☐ Food Plants
- ☐ Grain Bins
- ☐ Grain Elevators
- ☐ Meat Packing Plants
- ☐ Nursery Soil
- ☐ Tobacco Seed Beds
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- ☐ Insect Control, general
- ☐ Rodent Control, general
- ☐ Pink Bollworm Control
- ☐ Other
- ☐ Have Representative Call

Send request to Dept. 10, Michigan Chemical Corp.

Name

Company Name

Company Address

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MC

michigan chemical corporation *Saint Louis, Michigan*

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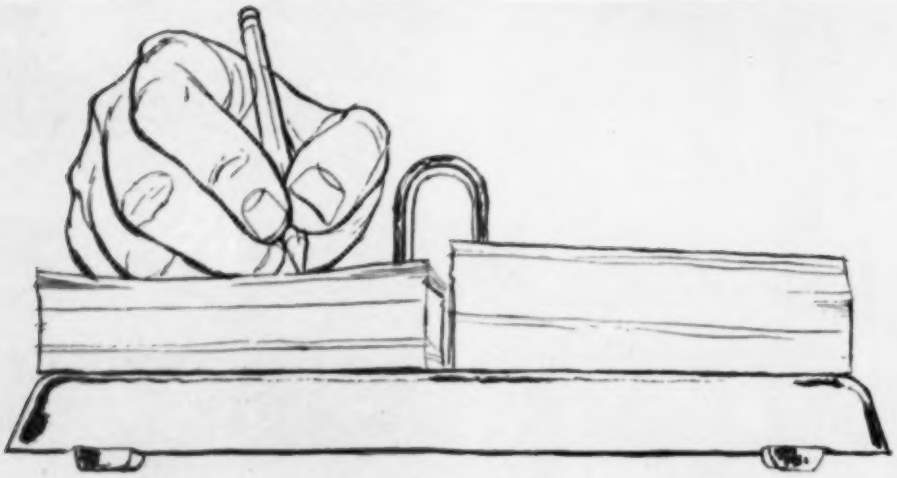
PRIME PRODUCERS OF DDT, PESTMASTER METHYL BROMIDE AND OTHER AGRICULTURAL CHEMICALS



Be SURE of next year's business...

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2,4-D Acid and Esters
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IPC
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INSECTICIDES

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Santochlor* (para-Dichlorobenzene)
Santophen 20 (Pentachlorophenol, Tech.)
Nifos*-T (Tetraethyl Pyrophosphate, Tech. For agricultural use only)
Niran* (Parathion. For agricultural use only)
OMPA (Octamethylpyrophosphoramide, Tech. For use on ornamentals only)

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CHEMICALS—PLASTICS
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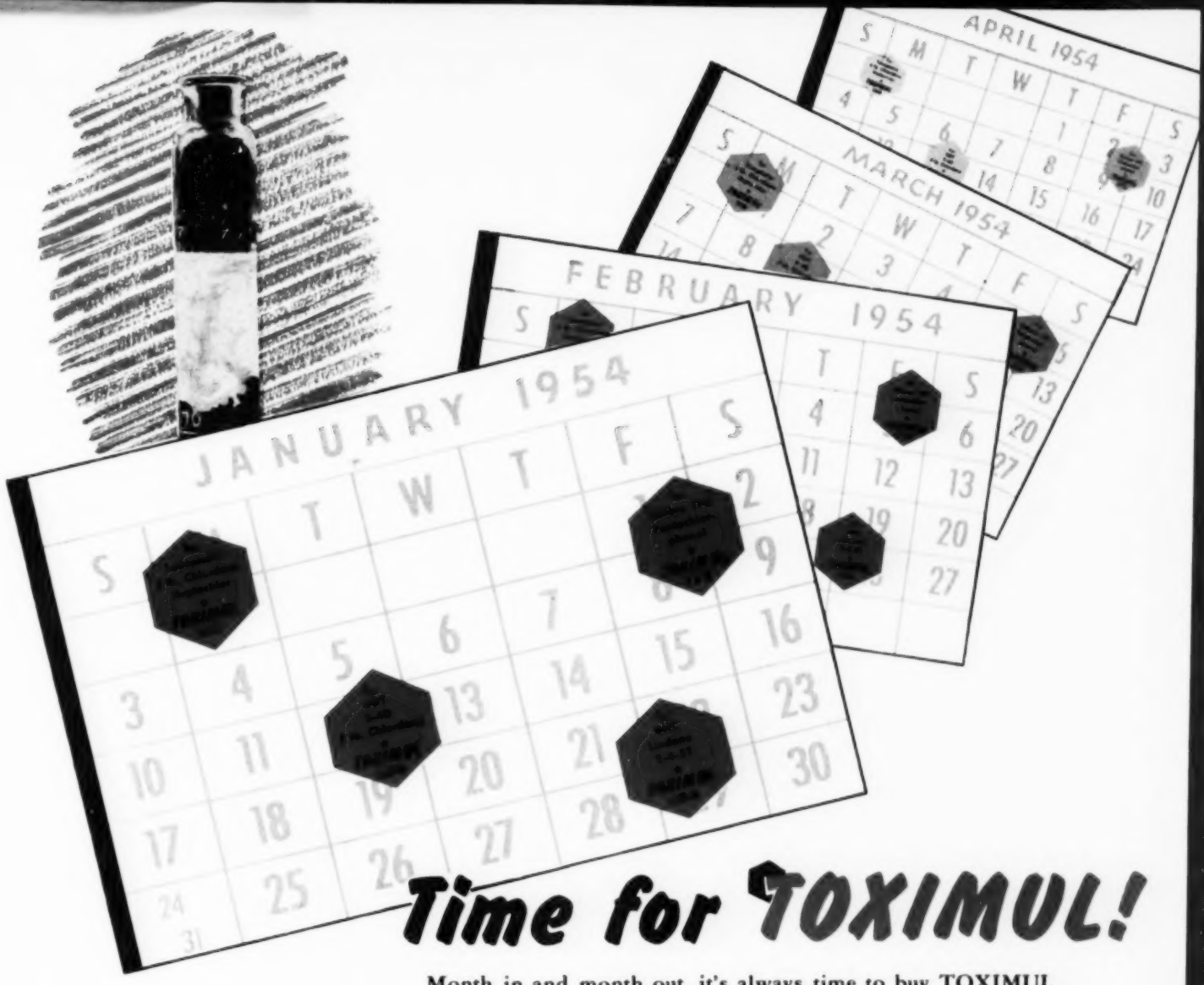
For information and quotations call the Monsanto sales office near you or write us: Monsanto Chemical Company, Organic Chemicals Division, 800 North Twelfth Blvd., St. Louis 1, Missouri.



Time for TOXIMUL!

Month in and month out, it's always time to buy TOXIMUL —if you want formulations of the highest effectiveness at the lowest cost!

Plants throughout the country are rapidly making TOXIMULS first choice as an emulsifying agent for all liquid formulations, because of their versatility, efficiency and economy. Ninol has led the way, with these fine products, in developing new anionic-nonionic blends to provide new highs in *flash dispersibility* and *emulsion stability* in all waters. This means better production, more satisfied users of your product—and yet you actually show a saving on costs!

It will pay you to investigate the TOXIMUL emulsifiers —there's one especially suited to your formulation. Write now for samples and bulletins—or if you have a unique problem, we will be happy to develop a special TOXIMUL to fit your needs.

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EMULSIFIERS
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Gentlemen:

Please send working samples and Technical Bulletins describing:

- ☐ *TOXIMUL* 150 (for use with Toxaphene, 4 lb. Chlordane, Heptachlor)
- ☐ *TOXIMUL* 250 (for use with Chloro IPC, Pentachlorphenol)
- ☐ *TOXIMUL* 300 (for use with DDT, 2-4D, 8 lb. Chlordane)
- ☐ *TOXIMUL* 400 (for use with BHC, Lindane, 2-4-5T)
- ☐ *TOXIMULS* (for use with other pesticides)

Signed _____

Co. _____

Street _____

City & State _____

A LOW-COST PRODUCER
of Blended Field Strength Insecticides

DDT MIXTURES

BHC MIXTURES

TOXAPHENE

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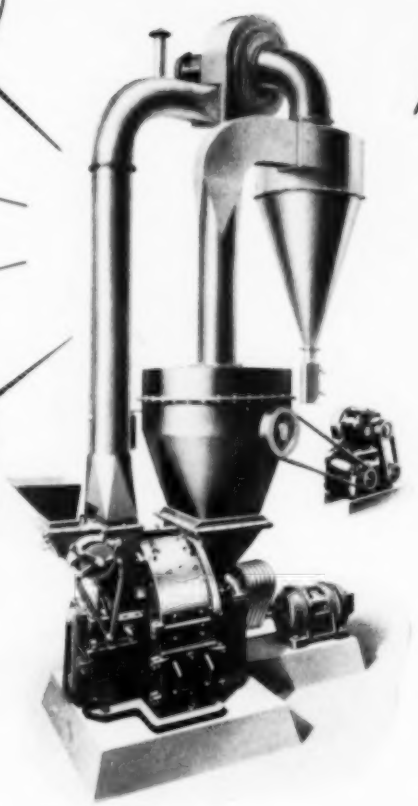
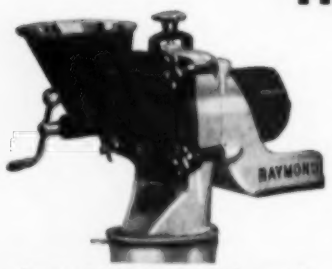


Raymond Whizzer Type IMP MILL



Raymond Laboratory Mill for running tests on small lots of materials. Write for Bulletins.

The operating records of many Raymond installations in the agricultural chemical field show that Imp Mills have proved to be highly efficient units for fine grinding and intimately blending field strength insecticides.

Because of the Whizzer Type Air Separator, these machines produce finer and more consistent finished products, and at record low costs.

The Raymond Imp Mill has no screens to break, wear out or clog. The air separation system used for classifying and conveying provides a cooling medium for removing heat generated in pulverizing. Lower mill temperatures permit greatly extended operating periods without shutdowns.

Whatever your capacity requirements or dust formulating problem, there is a size and type of Raymond Mill for handling your job economically to meet today's maximum specifications.

COMBUSTION ENGINEERING, INC.

SALES OFFICES IN PRINCIPAL CITIES

Raymond PULVERIZER DIVISION

1314 NORTH BRANCH ST.
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Bristol, Pa. Plant of the Rohm & Haas Company

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Rohm & Haas Company was the first to manufacture and sell a commercially successful organic insecticide and thus has almost a quarter of a century of experience in the organic insecticide field. All of the following important "organics" have been produced in volume for several years. Whether you need a few hundred pounds or multiple carloads—we offer for prompt shipment:

- **DDT Insecticides**
  - Technical ground and flake
  - Solutions
  - Emulsifiable concentrates
  - Wettable powders
  - Dust concentrates
- **RHOTHANE (TDE or DDD) Insecticides**
  - Technical flake
  - Solutions
  - Emulsifiable concentrates
  - Wettable powders
  - Dust concentrates
- **DITHANE Fungicides**
  - Solution
  - Wettable powder
  - Dust concentrate
- **2,4-D Weed Killers**
  - Acid
  - Butyl ester
  - Isopropyl ester
  - Capryl ester (low volatile)
  - Amine salts
  - Emulsifiable concentrates
- **2,4,5-T Weed Killers**
  - Butyl ester
  - Isopropyl ester
  - Capryl ester (low volatile)
  - Emulsifiable concentrates

LETHANE in aerosol mist, fog or liquid spray formulas gives fast knockdown of insects on contact, cuts manufacturing costs.

TRITON Emulsifiers are also manufactured and offered by Rohm & Haas in a wide selection for the economical and effective emulsification of the many organic pesticides in use today.

DITHANE, RHOTHANE, LETHANE and TRITON are trademarks, Reg. Can. and U.S. off. and in principal foreign countries.

CHEMICALS FOR AGRICULTURE

ROHM & HAAS COMPANY

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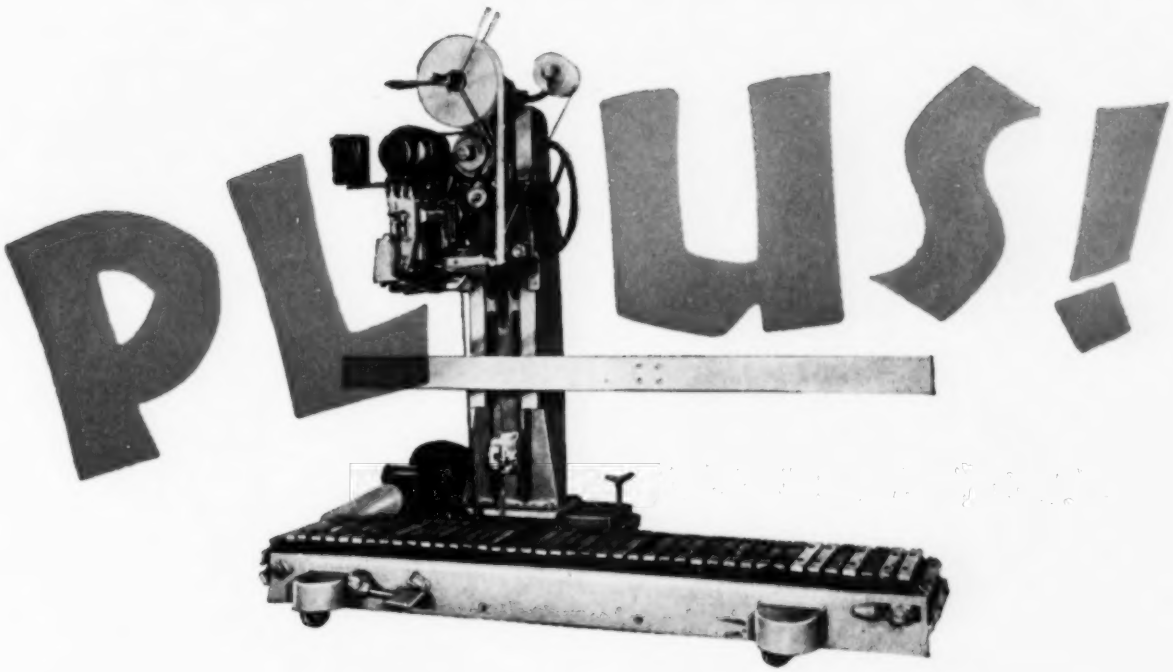
The Bag Closing Machine With a Real



There's an extra PLUS built into every model ET BAGPAKER delivered . . . the PLUS of assured day-in, day-out top performance.

The Model ET ties in with your existing filling and weighing equipment...closes open-mouth, multiwall paper bags semi-automatically... gives you sift-free, stronger, more economical bag closures with the famous BAGPAK cushion stitch.

You can count on the model ET BAGPAKER to give you faster packaging and better product protection...at lower cost.

Model ET applies famous "Cushion-Stitch" over dry tape for sift-proof closure. Model E-I applies "Cushion-Stitch" only, for use where sift-proofing is not essential.

Check these Economy and Efficiency Features:

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- ✚ *Fast adjustment to bags from 25 to 100 lbs.*
- ✚ *Completely portable—rolls to any packaging station.*
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- ✚ *Hoepner No. 150 Heavy Duty Sewing Head with automatic brake to prevent "coasting".*

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BRANTFORD, CANADA

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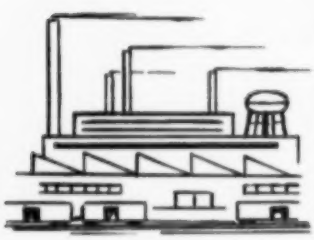
Minerals are just as essential to healthy plant growth and optimum production of vitamin-rich crops as are nitrogen, potash and phosphate. Mineralized fertilizer stimulates sales and creates new business because the results are conclusive. Fertilizers that give superior results are the fertilizers that the growers buy.

As basic producers of minerals, we would like to discuss mineralized fertilizer with you and show you how to increase your fertilizer tonnage and profits by the addition of minerals.

We can supply mineral mixtures to your own specifications in large or small quantities.



☆ COPPER SULPHATE ☆ ZINC SULPHATE ☆ MANGANESE SULPHATE ☆ MAGNESIUM SULPHATE ☆

SOLUBLE TRACE MINERALS

Tennessee's trace minerals are soluble and their nutritional value is immediately available to the plant. Soluble trace minerals are more economical and faster acting.

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TRI-BASIC Copper Sulphate is a chemically stable copper fungicide containing not less than 53% metallic copper. TRI-BASIC Copper Sulphate can be used as a spray or dust on practically all truck crops and citrus crops. Control persistent fungus diseases—correct copper deficiencies from a nutritional standpoint. Use TC TRI-BASIC Copper Sulphate.

☆

COP-O-ZINK · NEUTRAL COPPER ZINC

COP-O-ZINK is a new, neutral copper-zinc fungicide containing 42% copper and 11% zinc. COP-O-ZINK gives a superior performance in control of fungus diseases. COP-O-ZINK composition of two essential elements gives it added value in correcting deficiencies of zinc and copper and in stimulating plant growth. COP-O-ZINK is compatible with all inorganic and organic insecticides. No lime is required. For use in spraying or dusting.

NU-Z · NUTRITIONAL ZINC

NU-Z contains 52% metallic zinc. It is a neutral zinc compound which does not require the addition of lime for direct foliage application. NU-Z gives excellent coverage and adherence to plant foliage, thus rendering it available over a longer period of time. Safe for direct application. For zinc deficiency and plant nutrition—use as spray or dust.

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advantages

The St. Gobain process manufactures complete Nitrophosphate granulated fertilizers in one continuous automatic operation. Its extreme flexibility permits the production of various nitrogen-phosphorus-potash formulae without altering the equipment.

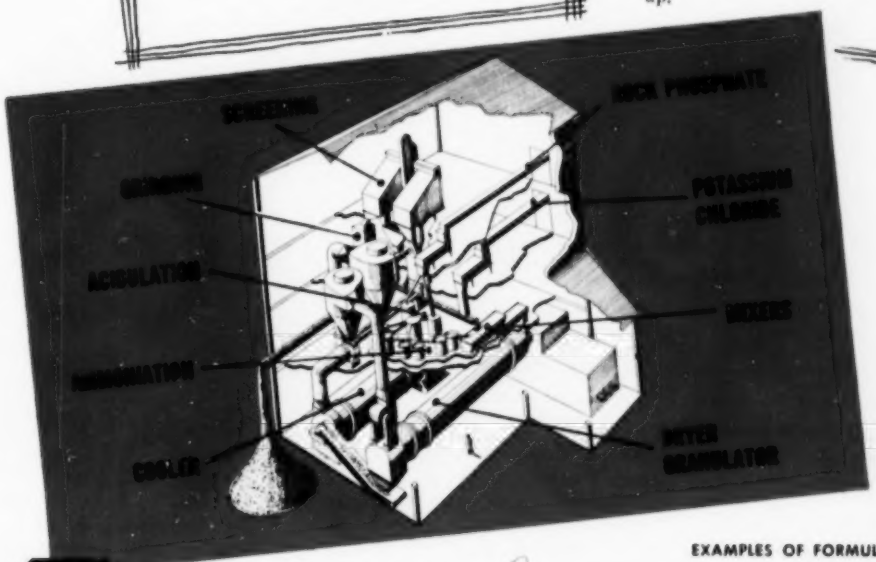
benefits

You benefit from the improvements made during the ten years of successful industrial operation. The St. Gobain system reduces the sulphuric acid consumption by replacing it with nitric acid. No phosphate rock grinding is necessary.

Capital

Investment and operating costs are low due to simple equipment, continuous operation, and to a very high yield.

St. Gobain plants are built for 30,000 tons of fertilizers yearly capacity and up.



EXAMPLES OF FORMULAE PRODUCED BY ST-GOBAIN PROCESS

N %	P_2O_5 %	K_2O %	
10	10	17	(sulfo-nitric acidulation)
11	11	11	" " "
10	15	20	(phospho-nitric acidulation)
12	15	18	" " "
12	12	20	" " "
14	14	14	" " "
10	20	20	" " "

For further information write to

General INDUSTRIAL DEVELOPMENT CORPORATION

270 PARK AVENUE, NEW YORK 17, N. Y.

AGENTS FOR ST-GOBAIN PROCESS

For effective chemicals plus service in depth —Count on Pennsalt!

WHEN you use Pennsalt Chemicals you get Pennsalt service—and formulators all over will tell you that's truly a worthwhile combination! Here's why:

Pennsalt agricultural chemicals are thoroughly tested products, proved in the laboratory and under actual growing conditions. Technical control during manufacture assures users of uniform, high quality.

For your guidance, Pennsalt publishes extensive technical information. Pennsalt also publishes the famous "How to do it" series of free service bulletins.

To assure you of prompt delivery, Pennsalt maintains branch manufacturing plants and warehouses throughout the nation.

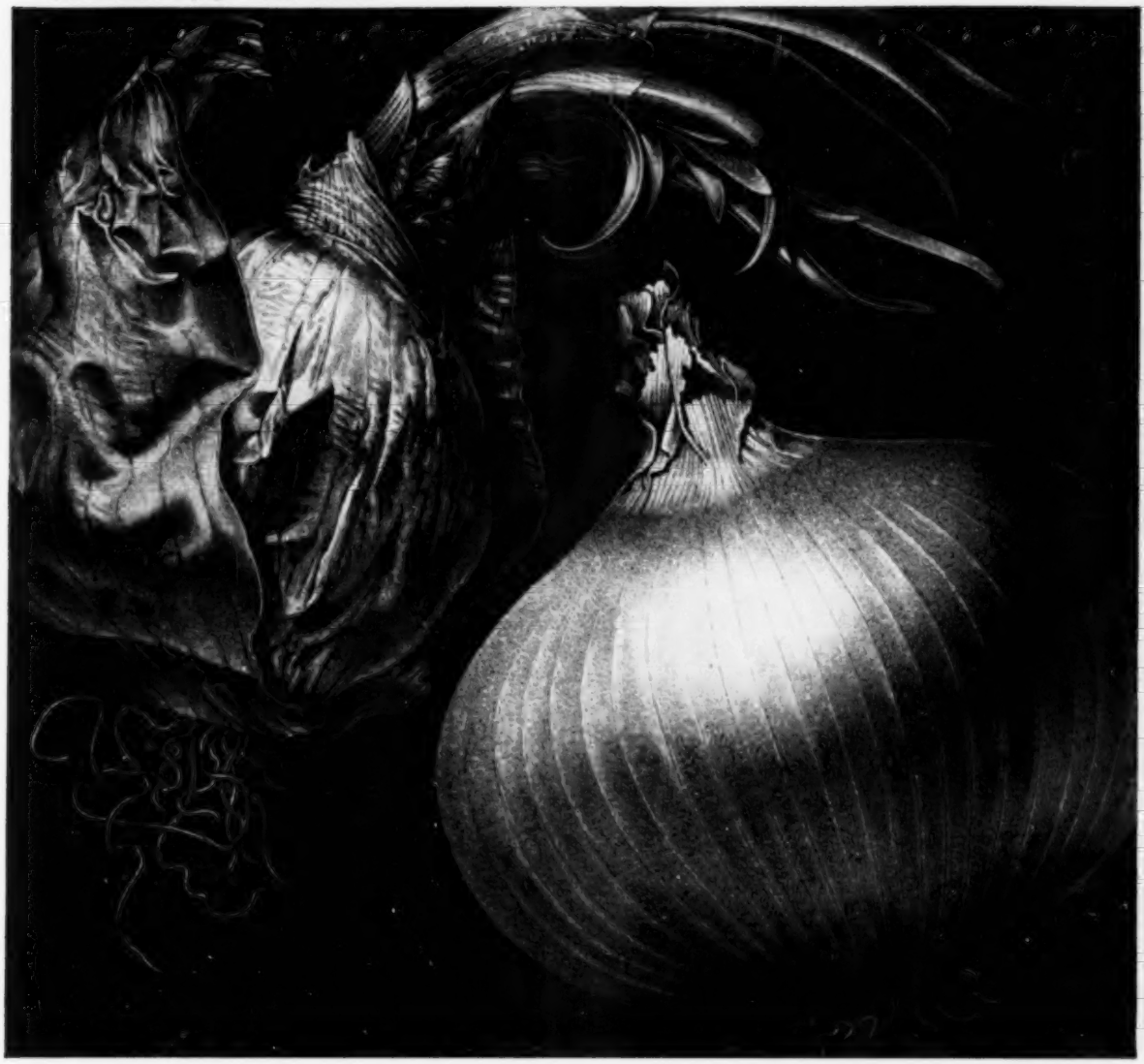
If you run into a problem not solved by standard chemicals or mixes, Pennsalt will help you devise a special formula.

Pennsalt service includes the Pennsalt representative who serves you. He has a sound academic and practical background in agricultural science. Because he serves a wide, diverse territory, he can offer you extensive experience and assistance in solving your problems.

Over and above all these things, however, is one important point to remember: Pennsalt is a *basic* chemical producer able to assure you of a constant supply of the chemicals you need even during unusual economic conditions.

That's Pennsalt service! To get all the details, talk to your Pennsalt representative. We'll gladly send you his name. Write: Agricultural Chemicals Dept., Pennsylvania Salt Manufacturing Company, 175 Widener Bldg., Philadelphia 7, Pa.; Tacoma, Wash.; Bryan, Tex.; or Montgomery, Ala.

Left—untreated onion; Right—treated with MH-40



Naugatuck nips storage growth in bud!

The United States Rubber Company's Naugatuck Chemical Division has good reason to believe it has dealt a death blow to destructive storage growth. The reason is a new Naugatuck chemical—a water soluble salt containing 40% maleic hydrazide and called MH-40.*

Every grower knows the advantage of storing away part of a crop like onions until the market is more favorable. And every grower also knows the risk involved—namely, the sprouting, shriveling and wrinkling which can make that crop unsalable.

As far back as 1947, Naugatuck's research scientists came up with the first version of MH-40. Since then, working in cooperation with more than 250 experiment stations and other agriculturists, they have discovered hundreds of potential uses for this unique new chemical. One of these uses was for the inhibition of storage growth.

Today MH-40 is commercially available as a grass inhibitor and wild-onion killer. And it won't be long before it will be made available as a storage growth inhibitor, too! *U. S. Pat. No. 2,614,916

MH-40 is one more example of Naugatuck know-how at work, always striving to introduce new and better products to the agricultural field.

UNITED STATES RUBBER COMPANY Naugatuck Chemical Division, Naugatuck, Conn.

manufacturers of seed protectants—Spergon, Spergon-DDT, Spergon-SL, Spergon-DDT-SL, Phygon Seed Protectant, Phygon Naugets, Phygon-XL-DDT, Thiram Naugets, Thiram 50 Dust—fungicides—Spergon Wettable, Phygon-XL—insecticides—Synklor-48-E, Synklor-50-W—fungicide-insecticides—Spergon Gladiolus Dust, Phygon Rose Dust—miticides—Aramite—growth retardants and herbicides—MH-30, MH-40—pre-emergence weed killers—Alanap-1.

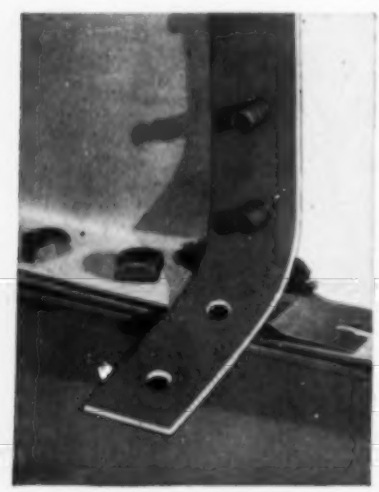
NOW—designed specifically to hold powder-fine phosphate!

BUTLER bolted steel tanks

Butler engineers have designed these tanks to meet your special needs for bulk storage of powder-fine rock phosphate. Precision-made joints were combined with the strength of heavy-gauge steel to give you a tank that resists the heavy internal pressures of phosphate and the external forces of high winds. The result—a tank that stays phosphate-tight for years to come with minimum upkeep and maintenance.

Butler rock phosphate tanks are permanent, yet can be easily disassembled and moved. There are sizes available to fit all rock phosphate storage needs.

All joints are positively sealed with pre-punched rubber gaskets.



For lower costs and higher profits... switch from bag to bulk operation

Here's one way you can cut costs and boost profits with Butler rock phosphate tanks. Switch from bag to bulk operations and slash your handling costs, buy at lower bulk prices, and give your customers better service by spreading phosphate directly on their land. Write today for full information about Butler bolted steel tanks designed specifically for your rock phosphate storage needs.

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for correction of mineral deficiencies...

It's been an impressive beginning, this correction of iron deficiency in Florida citrus. Consider, trees have been restored to full vigor and yields increased by 5 to 10 times in severe cases of deficiency.

The significance? Applications of Sequestrene iron complex *have* corrected one of the most difficult deficiencies to cure, but in addition this complex has emphasized the prospects of the other Sequestrene metal complexes. These complexes are being field tested on such crops as peaches, pears, cherries and vegetables as well as field, pasture and forage crops and various flowers. Thus, the more efficient and effective method of treating plant deficiencies may be very close at hand.

Experimental quantities of Sequestrene in combination with iron, zinc, copper, manganese, and calcium are available to qualified applicators upon request.

*"SEQUESTRENE" is the brand name for chelating compounds produced by Alrose Chemical Company, a Geigy Company.

Geigy

ORIGINATORS OF DDT INSECTICIDES

GEIGY COMPANY, INC. • 89 BARCLAY STREET • NEW YORK 8, N. Y.

GEIGY COMPANY, INC. ARE THE EXCLUSIVE SALES AGENTS FOR SEQUESTRENE METAL COMPLEXES IN THE AGRICULTURAL FIELD.

Takes the bugs out of your golf

FOR MANY A WAVERING, unsunk putt, for approaches that head flagwards but fetch up in a trap, blame those insidious enemies of golf—the turf insects that dote on a tasty green or fairway.

But from now on, you may also blame your greenskeeper for failing to know that a powerful Shell insecticide, aldrin, is deadly to pests that ruin grass, and wreck the accuracy of your game.

Not only on golf courses, but in parks, private lawns, athletic fields—and vital pasture land, too—aldrin controls turf insects *in the destructive grub stage*. It penetrates soil to curb the larvae of June beetles, Japanese beetles and a host of other "bugs," and at the same time wipes out whole colonies of soil-spoiling ants.

Use of aldrin to control lawn pests brings this famous insecticide right into the big home-owner market. Formulators should make sure they order and prepare enough aldrin to satisfy local demands.

Shell Chemical Corporation

Julius Hyman & Company Division, P. O. Box 2171, Denver 1, Colorado

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Let's Sell the Idea

by

Paul Mayfield

Manager, Naval Stores Division
Hercules Powder Company
Vice-president, National Agricultural
Chemicals Association

TILLING the soil is probably the oldest of man's pursuits; as an industry, we are an infant in a mature marketplace. And as a comparative newcomer on the farm, we have an uphill fight to win a place. The underlying problem that faces the agricultural chemical industry is: education. We must educate the farmer—the ultimate consumer of all of us—on the advantages our products give him.

Why did the farmer buy tractors, or try contour plowing, or decide to raise cattle in areas previously used for other ventures? Education is the answer. He was shown—as the prototype of the American farmer, the man from Missouri, has to be shown—that these new ideas meant money in his jeans, reduced his chances of loss, and improved the efficiency of his chores.

The agricultural chemical industry has yet to complete its education of the farmer. While it received new impetus from chemical developments born in World War II days, the industry still must admit that only a minority of farmers are "sold" on the virtues of agricultural chemicals. A slightly larger segment of our farm population may turn to agricultural chemicals in times of emergency; they either act just in time or too late to avert disaster. The majority has not been convinced —in other words, they have not learned —that the ounce of prevention is superior to the cure. Even the dealer must be shown that agricultural chemicals will add to farm prosperity, and these humbly-priced products will thereby help him sell his tractors, sprayers, and other larger-profit items.

Our task is to teach the farmer that the proper use of agricultural chemicals will help him get higher yields, raise better stock, and increase his income. He must be persuaded that the products of our industry can improve his economic status. At this stage, the agricultural chemical industry needs to sell itself. We must sell the *idea*—more than any individual brand-name product.

Some of us have brought this type of informative material to the attention of the farmer. Unfortunately, others have not. They have made extravagant claims for their products and disparaged their competition. They have made price cuts to win customers, and in some regrettable instances, they have sacrificed quality. Price wars mean that all factors in the industry suffer—manufacturer, formulator, distributor,

(*Turn to Page* 125)

CUTWORM CONTROL WILL SAVE YOUNG CORN

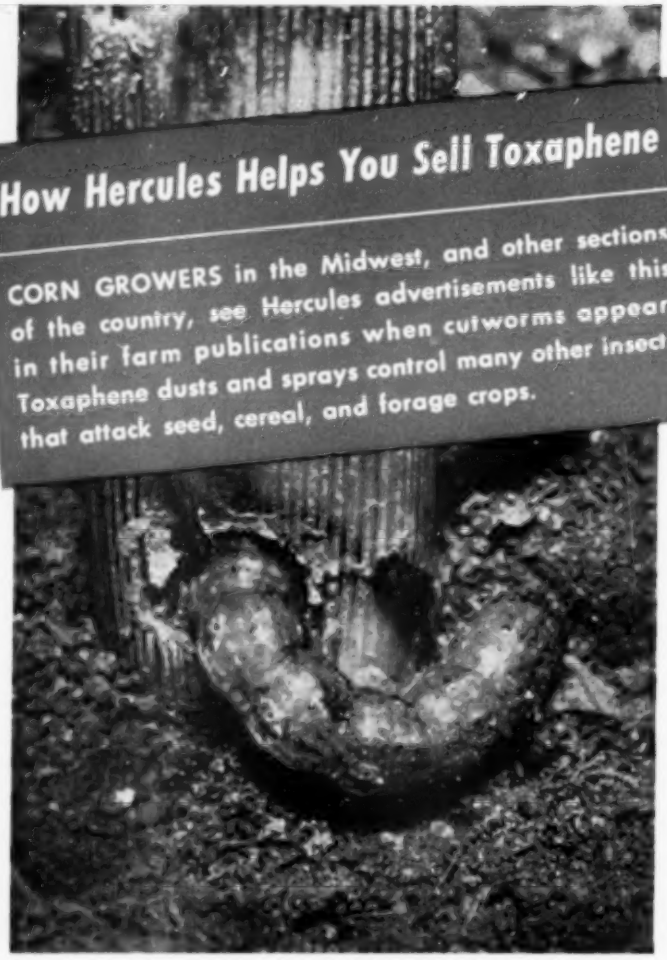
How Hercules Helps You Sell Toxaphene

CORN GROWERS in the Midwest, and other sections of the country, see Hercules advertisements like this in their farm publications when cutworms appear. Toxaphene dusts and sprays control many other insects that attack seed, cereal, and forage crops.

Prompt action is demanded when cutworms come. Once these pests get into your young corn and other crops, they can do serious damage. Many of them cut the stalk of the plant they are feeding on. When this happens, there's nothing you can do but replant. Why take chances on losing your crop when toxaphene insecticides cost so little and are applied so easily? Put toxaphene to work quickly at the first sign of cutworm damage.

Toxaphene has produced excellent results in controlling cutworm outbreaks. In Iowa, for example, hundreds of acres of corn were treated successfully. Local authorities estimated that 90% of the cutworms were killed, and the few that were left stopped feeding. Where toxaphene was not used, Iowa farmers had to replant an estimated 800,000 acres of corn because of the cutworm damage.

Agricultural authorities in Midwestern states recognize toxaphene insecticides for the control of cutworms. As a result of tests on corn, many state agricultural experiment stations now recommend sprays at the rate of two pounds of actual toxaphene per acre, applied with low-gallonage equipment.



Here's a cutworm living up to its name, and cutting into a young corn stalk. Plants thus damaged are ruined, and then replanting is all that you can do. Cutworms are often hard to find. Most of these insect pests stay hidden in the soil during the day, and do their feeding at night. Upon the first sign of damage check the soil around the plants and apply toxaphene insecticides as soon as worms are found.

When cutworms attack, healthy young corn like this can be ruined overnight. The use of toxaphene dusts or sprays will protect your crop in its early stages and help assure a full harvest. Apply immediately when the first larvae are discovered. Toxaphene is recommended by the Iowa Agricultural Experiment Station.

Whether you grow corn or alfalfa, clover or other forage crops, you should have a copy of this 16-page folder "Seed, Cereal, and Forage Insect Pests". Containing full-color drawings and descriptions of many insects that attack seed, cereal, and forage crops, it enables you to identify these insect pests, to know where and when to look for them, and how they may be controlled effectively. Send to Hercules for your free copy.

TOXAPHENE dusts · sprays

Naval Stores Department
HERCULES POWDER COMPANY
970 King St., Wilmington 99, Del.

NX53-7R

Editorial COMMENTS

ONE of the most valuable assets any industry can have is a wide-awake and helpful trade association. Particularly is this true when the industry is one which holds many hazards from the standpoints of Federal and State legislative snares, use hazards, and erratic markets. The makers of insecticides, fungicides, weed killers, rodenticides and other toxicants coming under the general term "pesticides"; have been greatly benefitted through the National Agricultural Chemicals Association which this fall observes its 20th anniversary.

Elsewhere in this issue, the six presidents of the NAC Association . . . beginning with 1933 . . . express their views on the trade from the standpoints of past, present and future operations. All prominent figures in the pesticide industry, their observations carry a considerable amount of weight. Thus, when optimism is expressed, it may be regarded as being founded on sound logic.

Prominent in a number of the comments is the idea that more and more education is needed at all levels of the pesticide trade, filtering down to the eventual user who needs it most of all. The NAC has done a great deal in this direction during its two decades of existence, and it has plans for expanding this phase of its activities. This, it seems to us, is one of the primary functions of an Association such as NAC, and should be backed by all of the companies and people in the industry.

The record of NAC over the years has been a good one. It has gone through hectic war years, depressions, shortages, surpluses and tremendous expansion and still not only survives but emerges apparently the stronger for having had the experience!

The years ahead may hold equally trying situations, but our bet is that the NAC will continue to be a great asset to the entire industry . . . for non-members as well as those who pay the freight to make the whole operation possible.

Our editorial hats are off to the National Agricultural Chemicals Association and its leadership. Through the nearly eight years of this magazine's existence, we have worked closely with the group; boosted its programs editorially; spoken out against practices which both the association and the magazine regarded as detrimental to the best interests of the trade; and, in short, have worked consistently toward the same end. At the beginning of the Association's third decade it seems appropriate for a salute of this nature. This publication and its staff expect to continue the whole-hearted cooperation of the past and to give the agricultural chemical industry our complete support in the years ahead.

With twenty years of activity behind it, the NAC holds its annual fall convention at the Essex & Sussex, Spring Lake, N.J. Here is the meeting program and a history of the

Natl. Agricultural

DURING the twenty years of its existence, the NAC Association has grown both in size and importance, with the expansion of pesticide use in agriculture and the consequent growth of the industry.

The industry itself is relatively young as a branch of chemical production in the U.S., having experienced its first growing pains just after the first World War when insecticides and fungicides containing lead arsenate and copper sulfate, respectively, were accepted widely in what was then considered more or less adequate agricultural pest and disease control.

The years 1944 and 1945 apparently mark the emergence of the pesticide industry into its real adulthood. Up to that time, agricultural chemicals were largely inorganic compounds with additional production of plant derivatives such as rotenone, pyrethrum and nicotine. Volume was increasing steadily, but there was a dearth of new products. The plunge into widespread and comprehensive research with the war years of 1941-45 had brought into being numerous new compounds which showed promise as agricultural pesticides.

Without the existence of an industry association, it is doubtful that the flood of new products could have been handled with anything like the order in which they were introduced. Confusion was inevitable in many areas, of course, but the NAC's cooperation with Government agencies and other groups helped to keep the situation in hand.

By centralizing the mass of material being published on new introductions and disseminating the information in a timely manner, the services of the NAC proved their worth and more and more companies became interested in its activities. Through this impetus, the group's membership more than tripled, and in keeping with this physical expansion, also its influence.

1953 Program

Wednesday, Sept. 9

Essex & Sussex Ballroom
Presiding Officer
Paul Mayfield.
General Manager,
Naval Stores Department
Hercules Powder Company,
Wilmington, Delaware.

10:00 A. M.
President's Address
Arthur W. Mohr.
president,
California Spray-Chemical Corp.,
Richmond, California.

10:20 A. M.
Secretary's Report
Lea S. Hitchner.
executive secretary,
National Agricultural Chemicals Association,
Washington, D. C.

10:30 A. M.
"Merchandising Chemicals For the American Farmer"
W. Raoul Allstetter.
vice-president,
National Fertilizer Association,
Washington, D. C.

10:50 A. M.
"Trade Associations"
Joseph F. Battley.
president,
National Paint, Varnish and Lacquer Association,
Washington, D. C.

11:10 A. M.
USDA Observations
J. Earl Coke.
Assistant Secretary,
U. S. Department of Agriculture,
Washington, D. C.

6:30 P. M.
Reception For Members and Guests. Essex & Sussex. Dress optional.

9:00 P. M.
Movies
Essex & Sussex Children's Dining Room.
Special Dances
Essex & Sussex Ballroom

9:30 P. M.
Board of Directors Meeting. Essex & Sussex Dance Studio

Thursday, Sept. 10

Monmouth Ballroom
10:00 A. M.
Fertilizer-Pesticides Mixtures
Dr. L. Gordon Utter.
Presiding
M. D. Farrar
Head, Department of Entomology
Clemson Agricultural College
Clemson, South Carolina
Eugene Ordas
Head, Product Development Div.
Velsicol Corporation
Chicago, Illinois

Chemicals Assn.

Early Days Recounted

ONE of the groups preceding the present Association was an unincorporated organization composed of agricultural insecticide and fungicide manufacturers. Officers of this group, according to NAC records, were Ernest T. Trigg, president of John Lucas & Co., Philadelphia, president; Thomas S. Grasselli, Grasselli Chemical Co., Cleveland, Ohio, vice-president; and Harry J. Schnell, *Oil, Paint and Drug Reporter*, New York, treasurer. This arrangement was begun in the summer of 1924 and continued without paid officers until the stock market crash of 1929 put a damper on activities.

After a couple of years of doldrums, the industry group merged with the Manufacturing Chemists' Association. In order to maintain some activity in the insecticide and fungicide field, the MCA set up an insecticide committee and named Lea S. Hitchner as chairman.

Thus, in 1933, the Insecticide Committee of the MCA had aroused a considerable amount of interest and backing from the industry, and in the fall of that year it was decided to re-establish an association of the pesticides industry. An organizational meeting was held in Atlantic City, New Jersey in August, 1933, and the Agricultural Insecticide and Fungicide Association came into being. The following officers were named:

President: L. S. Hitchner

Vice-president: R. K. Vickery

Secretary: June C. Heitzman

Chairman of board of directors: R. N. Chipman

Since that time the Association has achieved more and more prestige in the industry and has expanded and broadened its activities in keeping with the needs of agriculture and changing economic and scientific conditions.

In 1935, the young Association saw the need of establishing a

Spring Lake, N. J.

Rodney C. Berry
State Chemist
Virginia Department of Agriculture
Richmond, Virginia
C. C. Compton
Julius Hyman & Company Division
Shell Chemical Corporation
Denver, Colorado
Charles P. Harding
General Manager,
Manufacturing Department
Virginia-Carolina Chemical Company
Richmond, Virgina

Golf Tournament
7:00 P. M.
Annual Banquet
Monmouth Dining Room. Introduction of new Officers and Board Members and a salute to retiring Officers and Board Members. Dress optional. (Essex and Sussex dining room will be closed Thursday evening.)

Friday, Sept. 11
Essex & Sussex Ballroom
Presiding Officer
Arthur W. Mohr.
president,
California Spray Chemical Corp.,
Richmond, California.
10:00 A. M.

"Fungicides and Agricuture"
George L. McNew.
Director,
Boyce Thompson Institute,
Yonkers, New York.
10:20 A. M.

"Pesticides Registration"
Richard O. White.
Chief, registration section,
Livestock Branch,
Production and Marketing Administration, USDA,
Washington, D. C.
10:40 A. M.

F.D.A. Reports to the Pesticide Industry
George P. Larrick.
Deputy Commissioner,
Food and Drug Administration,
Department of Health,
Education and Welfare
Washington, D. C.

11:00 A. M.
Informal Session

Members will be given the opportunity to discuss with Association Staff and Counsel current Association and Industry problems including product liability and legislation. Questions submitted in advance will be considered. Questions from the floor are invited.

Howard Grady and Eugene Perrin will report on the cooperative promotion program with the National Sprayer and Duster Association.

"Lawyers' Committee" for interpretation of legislation and other legal matters of concern to Association members.

A year later, conditions made necessary the forming of the traffic committee which represents industry before federal agencies concerned with rates and classifications and other specifications for shipment of pest control products through interstate commerce. The same year saw the formation of the container simplification program.

The dissemination of statistical information to members was introduced in 1939 and the next year Association members began to color toxic insecticides as a step toward safety.

By 1941, Federal and state laws were becoming increasingly important to the industry, so the Association began then to compile and distribute data on legislation affecting the industry. Establishment of the NAC *News* came about in 1942 and through it, industry members were kept up-to-date on events affecting their business activities.

In 1949, the old AIF Association became the National Agricultural Chemicals Association and headquarters were moved from Madison Avenue in New York to the present location in Washington, D. C.

It was in that year, too, that the information committee was organized to act both as a coordinating and screening committee and set up broad programs for proposal to the Board of Directors. In effect, according to the NAC, the committee devises the best methods to use in disseminating the information which is collected from many sources. Subcommittees are appointed to consider specific questions as they arise.

20 Years of Steady

Progress

With....

Upon the occasion of the NAC Association's twentieth anniversary, we thought it appropriate to review the group's activities through the eyes of men who should know it most intimately . . . the six presidents whose memories go back to the very beginning of the organization.

Thus, Agricultural Chemicals presents to its readers the picture as seen by these six distinguished executives . . . the men whose responsibility it has been to guide and direct the Association into its present healthy state. —Ed.

* * *

LEA S. HITCHNER
1933-1940

HAVING the vantage point of the Association's first president gives me a long view back over the two decades of the activities of the pesticide industry. The years have all been full and each has shown a gain for the Association both in membership and in achievement.

Starting out as a group of fourteen members, the NAC has now grown to a membership of 140 which account for practically all of the pesticide production of the U. S. We have tried consistently both to instigate and carry out broad programs of industry-wide importance and we have fought for sound and workable legislation. We have also fostered and executed educational programs to inform the farmer as to the safe and proper use of the industry's products. This latter project is one which the Association hopes to continue with particular emphasis in order to establish a common-sense attitude toward pesticides on the part of users everywhere.

Naturally, as one of the founding group, events of those hectic days are still fresh in mind; the Atlantic City organizational meeting in 1933; the establishment of the Lawyers' Committee in 1935; the naming of a traffic committee a year

Association's past presidents recount to Agricultural Chemicals readers their terms of office and comment on the years ahead for the Association as well as industry.

NAC

later; the program for simplifying containers also in 1936; the initiation of statistical information in 1939; and the widespread effect on the industry of war clouds which threatened on all sides in those days.

As executive secretary of the Association since 1940, I have had an opportunity to witness further advances of the industry and to see growth of the Association that was practically undreamed of in the minds of the founders.

Now, as the Association comes of age after two solid decades of work with industry, Governmental agencies on both the Federal and State levels and with users of the industry's products, we can "point with pride" to the Association's record and look confidently into the future.

As has been said so many times before, the main obstacles lying in the way of proper use of pesticides are wrapped up in the problem of education. Finding a way to accomplish this end is one of the major objectives of the NAC in the years ahead. I am sure it can and will be done.

* * *

WARREN MOYER
1940-1943

WHEN in 1940 I was called to the Presidency of the Agricultural Insecticide & Fungicide Association something very near to panic existed in the industry with respect to association activities. This arose largely out of the transition from the N.R.A. to the subsequent era when activities required under N.R.A. became illegal overnight.

In this period of transition the vision of the late George Martin, of Sherwin-Williams Co., and the steady determination and courage of Lea Hitchner were of inestimable value in preserving the association and encouraging it to become a most constructive force. It is hardly necessary to dwell upon the growth that has taken place in the industry, the greatly increased complexity of its products and activities as well as the greatly improved service it renders to agriculture. The association has been very ably developed, expanded and diversified to better serve not only the industry but also agriculture and the government agencies interested in fostering pest control. It is now a fine and tested instrument for the correlation of efforts to the benefit of agriculture, government, industry and the public in general. The association has made great strides and is most certainly deserving of high praise.

* * *

JOSEPH B. CARY
1943-1946

WITHIN the interval of seven years since I served as president of the NAC (ending my last term in 1946), the insecticide industry has so expanded, altered, and changed that a comparison of present conditions with those of the times during and before World War II, is indeed a complicated job. Certainly the most obvious change is the rapid swing started during the war years by DDT and benzene hexachloride away from the old inorganic stand-bys to the new organic insecticides and fungicides; this trend has snowballed at a pace few would have predicted at the end of the war. Part of the striking increases in organic sales volume has been due to some comparatively new fields of use such as weed killers, defoliants, seed disinfectants, fumigants for stored grains, etc.

In this tremendous upsurge, many companies new to our field have entered into large-scale production of these new organics; and while most of these new insecticide producers come from the ranks of well-established and successful chemical companies operating in other fields, their knowledge of the methods and practices of distribution in our industry was sketchy at the start; and their attempts suddenly to market large tonnages from new factories have

Six NAC Association Presidents

LEA S. HITCHNER

Native of New Jersey, entered pesticide trade via Kiltone Co., Newark. Rose through ranks, became president of Lucas Kiltone affiliate of Sherwin-Williams Co. Served on various industry & Government committees in depression days; was made chairman of Insecticide Committee of MCA. Continued association activities when old AIF Association was formed.

WARREN H. MOYER

Mr. Moyer, a native of La Grange, Illinois, joined Chipman Chemical Co. in 1926 and has remained with the firm ever since. Has held responsible positions with Chipman for many years and was elected president of the company only this year. In addition to presidency of old AIF, he was chief of the Insecticide & Fungicide Unit, Chemicals Div., WPB, 1942-1944.

JOSEPH B. CARY

Joe Cary is executive vice-president, Food Machinery & Chemical Corp., San Jose, California. A native of Indiana, he holds a degree from Yale Univ. and has held an impressive number of responsible positions with a number of firms. He joined FMC in 1928, as vice-president and general manager of Niagara Chemical Div., becoming Div. president in 1942.

caused havoc in orderly distribution.

The increase in the scope of uses to which these new pesticides could be put resulted in the investment of large sums of money in basic research to discover new chemicals which were efficacious against insects, diseases, and weeds. The impetus given to this phase of our industrial operations was so great that overemphasis has probably been placed on basic research to the disadvantage of development of product and market research.

To offset partially the pressure for new pesticides, it may well serve the industry to invest more in cooperative market research programs. We need to reach the individual farmer so that our information on chemicals and the economics of their profitable use by him will be brought home to him on a simple, personal, and effective basis.

During the post-war period, prices of farm products were at their height, and the farmer had funds with which to increase his production through all available means, including chemicals.

However, during last year and the present season, a reversal of this situation has come about. Farm product prices have dropped materially, causing many farmers to go back to the old short-sighted policy of cutting their spray costs, despite the fact that normal use of these products could reduce overall cost of production and thus neutralize much of the drop in farm crop prices.

I believe that our industry could profit by concentrating more effort toward educational programs which would point out the economic gains possible through the use of pesticides. Our farms are being operated more and more by businessmen with technical farm educations, and the economics of the possible increase in yield or quality of crops by the use of more of the right insecticides and more fertilizers is more quickly sold to the new type of farm operator than was possible to the farmers of fifteen or twenty years ago.

We can also do more to overcome the prejudice which has been built up concerning the use of chemicals on edible crops. Our newspapers have played up the scarehead articles on the danger of poisoning from fruit and vegetables sprayed with new organic pesticides. As a result, our industry has had to combat many ill-considered Federal and State proposals for legislation involving long months of hearings and deliberations. Our association reports some 250 new bills were introduced last year in Federal and State legislative houses!

An apt comparison could be made between the critical market situation developed in the years of 1936 and 1937 and the current situation in which overproduction and ruinous prices are reproducing in the insecticide trade the same chaotic conditions which existed sixteen years ago.

In those earlier years, with their overproductive capacity, it was a fact that insecticide policies, even in the largest companies, were largely conceived and directed by insecticide department heads and other executives removed from the top company command. This resulted in a nation-wide economic dog fight that hurt

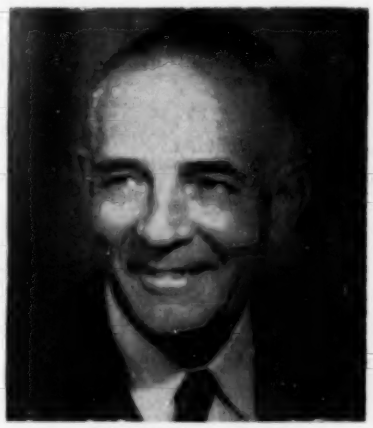
Review Old Times and Look Ahead

GEORGE F. LEONARD

A native of Michigan and a graduate of Michigan State, "Grub" has had long experience in affairs of industry, government and the Association. Only this year he retired as executive vice-president of Tobacco By-Products & Chemical Corp. after 38 years of service. Served as a committee chairman on OPA and as member of many Association committees.

ERNEST HART

Ernie, like other distinguished presidents of NAC, holds down a responsible job as vice-president of Food Machinery & Chemical Corp., in charge of chemical operations. A native of Rochester, N. Y., he was graduated from Michigan State College and was honored by it this summer, with an honorary "Doctor of Agriculture" degree.



ARTHUR W. MOHR

The current NAC Association president is a native of California, holds a degree from U. of C. (Berkeley) and served in World War I. Following the armistice, he joined Standard Oil Co. of California and has remained with them since. Worked in the Asphalt Dept.; was district manager of American Bitumuls Co. and since 1947 has been president of Calspray Corp.

everyone involved in furnishing insecticides to the farmer, from the manufacturer straight through to the distributor and dealer. As a matter of fact, this situation did not cure itself until the presidents or chief officers of several of the principal companies actually concerned themselves with getting the facts on the market situation, checking what their own companies were doing as against the standard methods of distribution with the accompanying background of prices, discounts, etc. It was not until these men actively entered the scene that the critical situation was ended and gradually normal conditions returned to the industry. Bad marketing practices now spreading are in my opinion largely due to the lack of market knowhow, much of it on the part of newcomers to our industry, and the general neglect of the ordinary principles of sound business on the part of many concerned in marketing insecticides. Much of this stems from the desire to maintain volume and position with the trade, regardless of the stockholder and his interests.

In the farm implement trade, no reputable manufacturer would attempt to introduce a new radical type farm implement without making the most extensive and complete market survey of which his organization was capable. This market survey, if well made, would give him a good fix on the size of the market for his machine, his possible competitors, the price levels at which the machine could probably be sold, etc. If the members of our industry or other chemical companies planning to enter the insecticide industry would take a leaf from the book of the machinery manufacturers, it would be a great step forward to restoring sanity to the situation. An adequate sales plan and a careful estimate of how the product of such a new plant might conceivably be distributed should be an essential part of the plans of a new producer in the pesticide field. Without this sort of business-like planning, which is used in many other industries as a matter of course, we end up with the present phenomonon of producers with production capacities double the market needs battling to keep their own plants running full at the expense of any and all others.

Looking Ahead

As for the outlook in the pesticide industry for the next twenty years, the field for the use of new chemicals as insecticides, fungicides, herbicides, fumigants, etc., is opening up so fast that only the lack of careful market study on the part of the factors in our industry handling this increasing demand can fail to make the future of the industry a rosy one by any past standards. If, as I hope, the glamor of the word insecticide has worn off for businessmen in the chemical industry, we should have a more cautious and hard-headed approach to the introduction of new capacity on all of our products. These new capacities should certainly be geared to the markets as presently existing or carefully estimated for the next few years. Otherwise a repetition of what has happened recently in the drug field and has already been somewhat duplicated in our own industry is apt to continue.

Personally, I am hopeful that

normal conditions will return to our industry and that the farmer, the dealer, distributor, and the manufacturer may once again share equitably in the dynamic farm world that is our market.

* * *

GEORGE F. LEONARD
1946-1948

ASIDE from many pleasurable personal associations, many things stand out in my memory about the pesticides industry. An observation which I have frequently made and which recurs to me is one regarding mental attitude toward this particular field. The interesting and challenging business of selling agricultural chemicals always requires a vast amount of personal handling and a unique understanding of the markets which is difficult to attain, except through experience. You have to get dust in your shoes and talk with the man at the end of the row.

The years from 1946 to 1949, when I served as NAC Association president, represented a significant period in my activities relating to this phase of the chemical industry. This period is particularly memorable because the industry had come into its own. It was in a phase of expansion which always brings new hope and vigor to a business — an era when those who engage in expanding an industry and creating new markets have a feeling of renewed accomplishment which often is lost without new materials to introduce or new progress to report.

Explaining what the introduction of these new pesticides meant to the man in the street and to the farmer was a prime consideration given by every company in this industry and by NAC Association. There was a definite lag in public information about these products, a lag which had to be overcome quickly in order that the full benefits from these new scientific discoveries could be used to the fullest advantage. I was fortunate to be in an excellent position to aid this educational program as head of a growing and active organization. Here was the opportunity to use my position as president of NAC to tackle broad educational issues and promote them from an industry-wide standpoint.

The remarkable job that was accomplished in educating the farmer and the man in the street can be attested to by the expansion of the industry over a relatively short period of time. In 1951 we reached the goal of over one billion pounds of technical pesticide chemicals produced in one production year. The acceptance of these products in the farmer's every day operations was a phenomenal thing and can be compared to the manner in which detergents caught the public's fancy.

It was a real pleasure to be part of these promotional and educational programs, and I hope that even though I have retired from my company that I can still be associated with those enthusiastic members in this phase of the chemicals industry in the days to come.

* * *

ERNEST HART
1948-1951

IT was my good fortune to be President of N.A.C.A. during the years 1950 and 1951 when the industry was in a high state of production and operations were for the most part profitable. Also, during this period the Association continued its spectacular growth in membership and interest was enthusiastic and fruitful.

During the years of 1950 and 1951 the "Organic Revolution" in the pesticide industry was in full swing, I refer, of course, to the introduction and use of scores of new synthetic organic chemicals as pesticides (DDT, BHC, parathion, toxaphene, etc.) replacing the older organic materials which had been in use for many years (lead arsenate, calcium, arsenate, copper compounds, sulphur compounds, etc.).

The extreme toxicity to insects of these new organic pesticides promptly broadened the base of their utility which in turn ushered in a period of rapid growth and prosperity for the industry.

Concurrent with this development was the production and use of many total and selective herbicides (weed killers) which were finding ready markets for huge quantities of various formulations. In fact, a whole new segment of the agricultural chemical industry was mushrooming into being. Old line chemical manufacturers began to take a new look at agricultural chemicals and many new plants were erected. Hundreds of small companies and individuals entered the field as processors of formulations and found usefulness and profit.

All of this was very pleasant for the Association's program, but like most such situations, it was a mixed blessing and brought with it new and knotty problems which cried for immediate solution. An example of such were highly toxic pesticides which created problems of human toxicity during manufacture, application, use and through toxic residues. Inasmuch as these problems were much more acute than had heretofore been the case, the situation created a chain reaction along regulatory lines which resulted in reviews of regulatory laws and new legislation by both the Federal and most all of the State Governments. Much time and effort was required by the Association's staff and its management and the member committees in connection with cooperation and guidance with the various Federal and State agencies having to do with legislation, regulation and tolerances. For example, 1,608,600 words of testimony were recorded in the Delaney Committee hearings alone. These hearings were held prior to proposed changes in the Federal Food and Drug Act.

Another minus factor was the rash of damage suits or claims brought against the Association members for alleged malperformance of its products. The situation became so acute that many members suffered cancellation of their product liability insurance. The Association, through its legal committee, tackled this problem promptly as it constituted a real

(*Turn to Page* 137)

Properties and Potentialities of

Liquid Fertilizer

by

R. L. Luckhardt*

Agriform Co., Inc.,
Wasco, California.

FIELD tests of fertilizer solutions have revealed some important facts during the past few seasons. This subject in the Pacific Northwest bears particular significance since demand for fertilizer is expanding rapidly in the area; increased supplies of ammonia solution and phosphoric acid are soon to be available; and statistics[1] show that fertilizer solutions are increasing in use more rapidly than are the dry forms.

An example of the trend toward solutions providing larger proportions of the fertilizer tonnage is the fact that for California in 1951, the amount of simple nitrogen sold as solutions was about 11 per cent of the amount sold in all of the dry simple forms. Six years before, this proportion had been but 1 per cent.

The definition of liquid fertilizer is variable. Since anhydrous ammonia is liquid when taken to the field, and also when run in the irrigation water, there are those who call this a liquid fertilizer. For the purposes of this paper it was determined with those responsible for the program that liquid fertilizer would be defined as fertilizer solutions, and would not include anhydrous ammonia, which in the Northwest is almost all applied to the soil as a gas.

Starter solutions, minor element sprays, and concentrated leaf-spray materials might also be included as liquid fertilizers, but are not covered by this discussion as their volume is small compared to the total liquid fertilizer sales.

Kinds of Solutions

THE several kinds of common fertilizer solutions should be reviewed first to familiarize the reader. Nitrogen solutions in use in the west include: (1) aqua ammonia 20 per cent N; (2) ammonium nitrate 20 per cent N; (3) ammonia-ammonium nitrate 40 per cent N; and (4) urea solutions, usually 20 per cent N. Phosphate solutions are usually made with phosphoric acid and provide about 52 per cent P_2O_5. Potash solutions are made from muriate of potash.

Mixes of N, P, and K are made of course, by combining various of these solutions. A recent development has been the manufacturing of liquid ammonium phosphates by the Agriform Company. These are neutral materials and may be handled without serious problems of corrosion. Other nitrogen solutions may be added to these ammonium phosphate solutions to produce the common formulas. An ammonium phosphate-sulfate solution is also manufactured. These neutral mixes are of considerable practical importance for the future. They make it possible for dealers and farmers to go into the handling of fertilizer solutions with only a nominal investment.

Application of Solutions

IN times past, almost all fertilizer solutions were applied through the irrigation water. Present practice is tending more to drill these same materials into the ground. This prevents loss of runoff in tail water, evaporation from the soil surface, provides better distribution, and results in longer activity. Spraying of fer-

*A talk before the Fourth Annual Fertilizer Conference, Washington State College, Pullman, Washington, July 1, 1953.

tilizers, particularly on crop residues, is another efficient method which is increasing in use currently.

Drilling of fertilizer solutions is done either on flat ground ahead of planting, in the sides of beds before planting, or as side dressings to growing crops. This application work is done by fertilizer companies, custom applicators, and the growers themselves. This development of application by drill is of importance to the future use of fertilizer solutions, for it makes possible the application of much larger volumes of material than can be done through irrigation water in a day's time. Dry land crops, or those grown with a minimum of supplemental irrigation, can be fertilized by drilling of solutions. This increases the areas of potential use.

The development of equipment for application of fertilizer solutions is one of the important keys to the future use of these materials. Since solutions can be handled by the farmer with relative ease and safety, there is found to be a growing demand for solution application equipment. Machinery should be adaptable for both drilling and spraying of plant food in addition to spraying insecticides and defoliants and the drilling of fumigants. Such versatility will make solution applicators highly acceptable and further increase the use of fertilizer solutions.

Properties of Solutions

THIS four-year study of the action of fertilizer solutions has included pot tests, strip applications in growers' fields, and replicated trials both at Experiment Stations and on farms. In addition to observations on growth, use has also been made of tissue tests and yield data. From these hundreds of studies on the fertilization of field and row crops of the west, certain conclusions have been drawn concerning the properties of fertilizer solutions.

The *first* property of fertilizer solutions as indicated by field tests, is their greater efficiency as compared to dry materials when crops are growing under conditions of insufficient moisture. The following situations have been found to restrict effectiveness of dry materials and make solutions more productive by comparison:

1. Steep slopes which allow water to run off too quickly for proper penetration.
2. Alkali soil which prevents proper water penetration.
3. High water tables which provide subirrigation and less surface irrigation is used.
4. During periods prior to the first irrigation on a crop.

Differences in crop production when a fertilizer solution was compared to dry forms have been published in mimeograph form by the County Agricultural Agent, Yuma, Arizona. This work, based on results of 1952 cotton trials,[2] reports that tests on two different ranches produced more yield from 59 pounds of N per acre applied as a drill of an ammonia solution, than was obtained from 100 or more pounds of nitrogen from a dry fertilizer.

Even under conditions of seemingly ample irrigation, field trials have been noted in which there was more immediate uptake of nitrate from bands of drilled solution than from bands of the same kind of fertilizer in dry form. This is regarded as important when used as a side-dressing to growing vegetables.

To summarize: although fertilizer solutions in the soil should be no different from dissolved dry fertilizer, actual field experience finds many conditions under which the dry forms of plant food are not sufficiently dissolved for best crop production.

A *second* property of fertilizer solutions is their more rapid nitrification as compared to dry materials. This may be due to differences in solubility. Also observed in field tests during cool weather, is the fact that there was more rapid nitrification of solutions of ammonia as compared to anhydrous ammonia. This of course would not be expected if both materials were applied in the irrigation water. But when drilled, more nitrate uptake into the plants fertilized with the solution has been noted.

The explanation evidently lies in the difference in concentration of the two materials; the solution being about ¼ as strong. It seems possible that the dilute solution form is more susceptible to bacterial action so that nitrate is readily produced.

A *third* property of solutions is in connection with phosphate fertilization. Higher initial phosphate concentrations inside crops, such as alfalfa, have been found when solutions are used as compared to dry formulations. In terms of use by the plant, the liquids have been more efficient. This is important in new plantings as well as in starting alfalfa after a dormant season. This may be due in part to the lower water-soluble phosphate content of dry formulations.

As an example of the difference in activity that is found between phosphate solutions and dry formulations, Fuller and Pew[3] report greater phosphate uptake in melons from phosphoric acid than from superphosphate. This additional activity of the solution form was associated with more marketable melons: double the increase of the dry form over the check.

A *fourth* property of fertilizer solutions is the excellent lasting qualities in the soil. We have come to understand, however, that more important in this respect than the physical form of the fertilizer; (dry, liquid, or gas,) is their makeup with respect to the form of nitrogen; nitrate or ammoniacal. Under our irrigation conditions the ammoniacal form is longer lasting in the soil than is nitrate.

For example, where we have fertilized potatoes in the past with one application of solution using ammonium nitrate as the nitrogen source, we have found it impossible to maintain sufficient nitrogen in the crop throughout the intensive irrigation schedule on the light soils. But now with the all-ammonia solution, excellent nitrogen nutrition has been maintained until maturity from one drill application at planting time.

We have obtained evidence in field tests that the alkaline am-

monia solution bands are longer lasting than neutral materials in terms of nitrate production. And we have found these alkaline bands at higher rates will nitrify more slowly, but will last longer than bands at lower rates.

The National Better Business Bureau has been quoted in a recent publication[4] on the subject of misleading advertising of certain liquid fertilizers for the garden trade. The stand taken is commendable and the points made are generally justified. But it is regrettable that the conclusion should contain the following statement:

> "Liquid Fertilizers have their advantages which can be properly advertised, but they will not displace dry fertilizers, which have other advantages, especially in providing nitrogen over a period of time."

If that paragraph is applied to liquid fertilizers as used in the field, it must be disputed. The facts are that liquid fertilizers *are* displacing the dry forms. And further, our field tests with the common dry forms of plant food indicate that they do not have any advantage in providing nitrogen over a period of time, but that bands of ammonia solution are as long lasting as any commercial material in common use.

A *fifth* property of solutions, of practical use in irrigation farming, is their natural adaptation to use as sidedressings when run in the irrigation water during the growth of the crop. These solutions are metered with accuracy and are applied to the soil by the seller without equipment or labor expense on the part of the grower.

Another advantage which growers find in the use of solutions is that they can turn the fertilizer off or on or adjust its flow themselves. This is possible because there is very little pressure on the solutions. Materials under high pressure require the services of the dealers to make adjustments.

As a *sixth* property of fertilizer solutions should be mentioned their ease of use on dryland grain. Growers in the Pacific Northwest area have found when they used ammonia solution injected ahead of planting, it offers these advantages:

1. The solution does not need to be applied as deeply into the soil as the more highly concentrated form, and this means less pull on the drill.
2. The lack of frosting on the drill shanks means no accumulation of dirt which increases the size of the shank and the furrow which it leaves, and from which ammonia might escape.
3. Ease of storage of ammonia solution means it can be held on the ranch and applied by the grower himself at any time through attachments on cultivation equipment.

Practical considerations of handling fertilizer onto the farm and into the soil may be the most important in determining the use of fertilizer solutions for dry grain. Although it might be thought that handling the extra weight of solution as compared to the concentrated anhydrous ammonia form would be a disadvantage on the steep hillsides, those who have used the solution have been well satisfed. The more shallow application and the lighter weight of the containers have both been found to offset the solution involved. We have observed that the solution form has agronomic advantages for grain: it results in more uniform distribution of the nitrogen between the drill bands.

As far as the farmer is concerned, price is also a property of any fertilizer, and will be the *seventh* mentioned here. In the San Joaquin valley of California at the present time, the price of aqua ammonia solution is cheaper per pound of nitrogen than the common form of dry fertilizer. In the southwest area, phosphoric acid is now sold for the same unit cost as treble superphosphate.

Where costs have been high it has been necessary for small companies to recommend small amounts of solutions after large quantities of cheaper materials have been used. The statement has been published that this comprised the total role of fertilizer solutions . . . for late dribbles only. Nothing could be further from the truth.

These observations concerning potential price and the possibility of complete fertilization by solutions are of considerable importance. Top-level executives in the Northwest's "fertilizer frontier" should be encouraged to take nothing for granted in the development of their thinking on fertilizers for their regions. Consideration should be given to all of the practical aspects of getting the plant food onto the farm and into the ground, and therefore giving fertilizer solutions a good trial under all growing conditions. From such work will come the information as how to use fertilizer solutions to their best advantages.

Potentialities

SEVEN properties of fertilizer solutions have been discussed, to show them to be at least equal to other physical formulations of plant food, and in certain important conditions, to be superior in terms of crop production. The basic factors controlling the future use of solutions are:

1. Sufficient quantities manufactured and available within an area.
2. Prices per pound of plant food equivalent to other sources.
3. Ample storage facilities and satisfactory drill equipment.
4. Willingness of agricultural leaders to test solutions, and make their results available as soon as possible.

All of these factors must go forward to realization at the same time. The manufacturers have committed themselves to an advanced position by their investments. It now remains for agriculturists, dealers, and growers to be as imaginative and progressive as possible.★★

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Florida Experimenters[1] Find Effective Means for Control of

Turf Insects

CONTROL of insect pests in lawns and turf areas has been a continuing problem for a number of years. Numerous types of toxicants have been employed to halt the activities of chinch bugs, white grubs, ants and other soil pests, some with fair success and others with small effect on the insects. Tests were conducted in both the 1952 and 1953 seasons.

With these pests demonstrating increased resistance to many of the pesticides regarded as standard a short time back, tests at Florida Experimental Stations, have been successful with a new material, granular dieldrin* which has proved to be effective against this type of pest. This product, only recently accepted by the U. S. Department of Agriculture for application on lawns and turf, is easily applied and maintains its residual effect against chinch bugs and other pests for five weeks or longer under normal conditions.

1. Paper based on work done at Gulf Coast Agricultural Experiment Station, Bradenton, Fla. and Sub-Tropical Experiment Station, Homestead, Fla., by Drs. E. G. Kelsheimer and D. O. Wolfenbarger.

*Product of Shell Chemical Corp., Julius Hyman Division.

Photo below: Treated area at the left and untreated grass at right shows how thoroughly soil pests kill grass and how application of granular dieldrin promotes good stand of lawn. Dry material was applied with a fertilizer spreader, then soaked into lawn. (Photos on this page and page 49 taken at Coral Gables, Florida).

Results in 1953

LAWN plots located at Sarasota, Florida were treated on June 17, 1953, during the hottest part of the day. (10 a.m. to 2 p.m.) The soil was very dry which made it necessary to water heavily. The treatments were applied as shown in table 1. Each plot was divided into two parts, one of which was left unwatered, the other watered after application of insecticides.

On July 3rd, readings were taken and again, on July 17, at the various plots. The results of these findings are noted in table 2.

Although dieldrin in granular form shows the greater promise for

J. C. Russell, district representative of Shell Chemical Corp., Sanford, Fla. (L) and Dr. D. O. Wolfenbarger, Sub-Tropical Experiment Station, Homestead, Fla., count chinch bugs floating in water to determine the insect population in surrounding soil. After inserting the top half of a five-gallon can into the lawn and filling the container with water, the insects floating to the surface after three minutes, are counted. Five weeks after application, dieldrin-treated plots in Coral Gables yielded an average of 0.75 chinch bugs per test as compared to adjacent untreated areas which yielded an average of 20.5 chinch bugs.

pest control in lawns and turf, liquid dieldrin is also useful in this type of application. Under some conditions, it has been preferred since it can be applied with a sprinkling can.

Dry formulations, on the other hand, should be applied with a lawn fertilizer spreader. Granules of dieldrin are about the size of fine sand particles which enables the material to drop down to soil level rather than adhering to blades of grass. Following application, the area should be watered down to wash the granules into the soil where contact is made with the pests.

By applying the material in the hottest part of the day, the insects get full benefit of its fumigant action which is one of its major means of killing. Control is also accomplished by contact by the insect.

Experiments with dieldrin have indicated its relatively slow action, a property that is a real asset since a toxicant with long residual properties will give superior control over a product of higher volatility which may kill quickly but is soon gone from the soil.

Lawn-owners or custom operators, in attempting to control these pests, should treat an entire area rather than only small spots that show symptoms of insect activity. Spot treatment has proved to be a poor method of economy.

While Florida is the first state

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Photo below: Large bare spot in right foreground shows typical damage done to lawns by chinch bugs. Not only do the insects damage the lawn by scarring the leaves, but they inject a toxic salivary juice which results in extensive damage as shown here.

Appraisal* of U. S. Supply of

Fertilizer Nitrogen

*Compilation made by a private company in a study of entire nitrogen picture.

COMMERCIAL use of nitrogen as a fertilizer material in this country dates from the beginning of the fertilizer industry, initiated in Baltimore about 1850. At that time nitrogen was supplied chiefly by materials of organic origin, largely wastes and by-products of other industries. These organics; namely, oilseed meals, fish products, animal tankages and dried blood supplied nearly 90% of the domestic consumption of fertilizer nitrogen as late as 1900. It is interesting to note that now, owing to their limited supply, low analysis, high unit cost and greater value as feed, less than 4% of consumption of fertilizer nitrogen in 1952 was in the form of natural organics.

During the first half of this century (until 1946 when production of synthetic ammonia was substantially increased) natural sodium nitrate from Chile and domestic by-product ammonium sulphate furnished the greater portion of the nation's chemical fertilizer nitrogen. Chile supplied about 100,000 tons of N in 1950. In recent years its relative position has been declining.

Fertilizers manufactured from atmospheric nitrogen have played an increasingly important role in the domestic industry since production of calcium cyanamid was started in Ca-

TABLE 1

NITROGEN:* Estimated 1952-53 supply for fertilizer purposes, United States and possessions

In tons of 2,000 pounds nitrogen (N)

Source	Ammonium nitrate [1]	Ammonium sulfate [2]	Other solids [3]	Natural organics [4]	N solutions compound [5]	NH_3 for ammoniation [6]	NH_3 for direct application	Total by source
U. S. production								
Synthetic ammonia	265,000	175,000	110,000	—	335,000	25,000[7]	255,000	1,165,000
By-product ammonia	—	180,000	—	—	—	—	—	180,000
Natural organics	—	—	—	35,000				35,000
Total	265,000	355,000	110,000	35,000	335,000	25,000	255,000	1,380,000
Exports	1,000	32,000	10,000	1,000	16,000	—	—	60,000
Net domestic production	264,000	323,000	100,000	34,000	319,000	25,000	255,000	1,320,000
Imports	131,000	59,000	145,000	5,000	—	—	—	340,000
Total supply U. S. and possessions	395,000	382,000	245,000	39,000	319,000	25,000	255,000	1,660,000
Percent (increase or decrease) of Sept. 1952 estimate								4.7
Percent (increase or decrease) of 1951-52 supply								16.5

For the purpose of this tabulation the following groupings have been made:
[1] Includes estimated ammonium nitrate, fertilizer grade, ammonium-nitrate limestone mixture, and ammonium sulfate-nitrate.
[2] Includes estimated ammonium sulfate content of imported and exported mixed fertilizers.
[3] Includes estimated ammonium phosphates, sodium nitrate, urea mixtures, calcium nitrate and cyanamid.
[4] Estimated nitrogen content of natural organics used in commercial fertilizer.
[5] Includes estimated nitrogen content derived from solutions and ammonia in exported ammoniated superphosphates and mixed fertilizers.
[6] Includes compound nitrogen solutions and ammonium nitrate solutions used for this purpose.
[7] Includes a small quatity of aqua ammonia.
*Revised.
Source: U.S.D.A.

nada in 1909. Manufacture of such fertilizers in the U. S. was placed on a permanent basis with the initiation of commercial production of synthetic ammonia in 1921. Subsequently, synthetic ammonia and its products have supplied a progressively larger portion of the country's consumption of fertilizer nitrogen; the proportion was almost 70% in 1952. Of the total 1952 ammonia production, about 30% was used for non-agricultural purposes. During this period, the use of agricultural nitrogen has increased seventeen fold and the proportion used as direct application increases every year. It might also be noted that more than 300,000 tons of nitrogen in liquid form are now used annually in the domestic manufacture of mixed fertilizer.

At present, natural gas is the cheapest source of hydrogen for large scale ammonia synthesis in the U. S. This situation may not prevail, over a long period of time, however, for the rapidly growing demand for natural gas and for other purposes, coupled with decreasing supplies, will eventually make its cost prohibitive for ammonia synthesis. This might happen before 1975*. Over the long range, major reliance must be placed on coal and its derivatives for the hydrogen requirement of ammonia synthesis.

Sources of Nitrogen

COMMERCIAL fertilizer nitrogen used in the United States is derived from four primary sources. In the increasing order of their importance they are: 1. Natural organic materials 2. Natural nitrates from Chile and other important nitrogen materials 3. Coal and 4. Atmospheric nitrogen. Of the total domestic consumption in 1951, these sources supplied roughly 5, 10, 20 and 65 per cent respectively. This is in marked contrast to the situation in 1935 when these same sources supplied respectively about 25, 35, 30 and 10 per cent.

*Fertilizer Resources & Requirements of the U. S. U. S. Department of Agriculture—February 1952—pp 30

Imports

FOR the year ending June 30, 1952 the United States will have imported an estimated 340,000** tons of nitrogen (as N) which represented about 21 per cent of the total consumed here this past year. However we will have offset this partially by exporting an estimated 60,000 tons of N. These figures are shown in Table 1. Imports of fertilizer nitrogen come chiefly from Chile, Canada and Western Europe. Since World War II, exports of nitrogen from the United States have been largely to the military occupied areas and to countries coming within the scope of E. C. A. Regarding the future of exports, The Fertilizer Committee of the U.S.D.A. in preparing "the President's Materials Policy Commission" says: "Owing to the disturbed status of international politics and to the efforts of countries throughout the world to produce their own requirements of fertilizer nitrogen, the future of nitrogen exports from the United States is difficult to predict. Under reasonably normal conditions, however, it appears unlikely at best that exports will undergo any large expansion."

Of particular interest is the amount of imported nitrogen brought into the Atlantic and Gulf ports during the season ending June 30, 1953. A port by port survey indicates that

**U.S.D.A. Estimate 1953

TABLE 2

Principal Mineral Nitrogen Materials — In Total Net Tons Imported Through Atlantic and Gulf Ports 1952-53

	C.A.N.* 20.5% Total	SUL. AMM. 21% Total	SODA 16%	ASN-26%
Norfolk	16,235	29,224	100,000	33,500
Baltimore	4,600	1,212	9,570	
Wilmington	67,653	17,825	43,000	5,900
Charleston	75,761	25,674	78,000	400
Savannah	67,175	46,849	118,633	4,700
Jacksonville		25,143	33,911	2,600
Tampa	29,712	15,777	29,712	28,048
Panama City			74,387	
Pensacola	16,921	4,874	44,716	1,300
Mobile	3,000		85,000 est.	
Gulfport	21,376		29,620	16,400
New Orleans	71,678	17,738	20,000	
TOTAL	374,111	184,316	666,549	92,848
EQUIV. N	76,693	38,706	106,648	24,140

TOTAL EQUIV. N 246,187 (net tons)

*Includes Calcium Nitrate and Ammonium Nitrate.

TABLE 3

Consumption of Selected Nitrogen Bearing Materials in the U. S. Year Ending June 30, 1952 — In Total Net Tons of Material

	1949-50	1950-51	1951-52
Ammonium Nitrate	577,562	638,376	799,189
Ammonium Sulphate	234,664	461,601	486,817
Nitrate Soda	627,424	683,967	681,761
Cal. Cyanamid	81,578	64,222	42,254
Other*	264,676	456,811	572,903

*—In 1951-52 "Other" N bearing materials consisted of:

C.A.N.	257,517	Aqua — Am.	20,026
Anh. — Am.	168,273	ASN — Urea	77,631
Cal. — Nit.	49,456		
	Other		
	572,903		

(All figures in short tons.)

for the fertilizer year just ended, about 1,317,824 tons of total nitrogen materials were imported through Atlantic and Gulf ports; the equivalent of 246,187 tons of N. These imports summarized by principal commodities are shown in Table 2. The figures were gathered by contacting each port individually so there may be some inaccuracies. The totals, however, should be representative.

Current Consumption

IN the 1951-52 season, the U. S. Fertilizer industry consumed 1,424,780 net tons of equivalent nitrogen. Of this, 648,275 tons of N (45.5%) were consumed in "mixed" fertilizer. The remainder, 776,505 net tons of N (54.5%) was sold in various forms for direct application. This tonnage represented an increase of 15.2% over the nitrogen used during 1950-51, an increase of 187,803 net tons. The nitrogen used in mixed goods was supplied chiefly by ammonium sulphate and ammoniating liquids. The principal sources of this nitrogen are itemized in Table 3 in total tons.

Based on current information as to when a number of the new synthetic ammonia plants are expected to be completed, making allowances for some increased production at by-product plants and assuming about the same import-export balance as in 1951-52, the 1952-53 available supply will run about 1,660,000 tons of nitrogen (N) representing an increase of 16½ per cent above the reported 1951-52 supply of 1,425,000 tons. See Table 1.

TABLE 4

Total Production Anhydrous Ammonia (In Tons of N) Present and Anticipated

Jan. 1, 1953	—	1,756,000
July 1, 1953	—	2,000,000
Jan. 1, 1954	—	2,192,000
Jan. 1, 1955	—	2,683,000
Jan. 1, 1956	—	3,098,000

Anticipated Consumption

FARMERS spent about 880 million dollars for commercial fertilizer in the calendar year of 1951. It is estimated that they will spend more than 1,300 milion in 1955. This represents an increase of about 50%. Such an increase is approximately equal to the increase in annual consumption that occurred in the 13 years preceding 1951. If this increase is proportionate over all materials, the nitrogen consumption for fertilizer in 1955 will be about 2,187,000 tons of N—an increased consumption of about 763,000 tons of N.

Expansion Program for N

ON the basis of certificates of necessity applied for and approved, expanded facilities ultimately will provide over 750,000 additional tons of N a year in solid forms and over 1,000,000 additional tons of N a year as anhydrous.

Anhydrous and Liquid N

THE estimated nitrogen requirements of the Department of Agriculture for fertilizer purposes and the estimates of the National Production Authority for industrial and military requirements by 1955 were incorporated into the Defense Production Administration's Expansion Goal Number 1. The program called for approximately 1.3 million tons of added nitrogen capacity by 1955 over the installed capacity of 1.639 million tons as of January 1, 1951.

Applicants for necessity certificates and CMP-4C construction permits have advised NPA that they proposed to supply more than the requested amount of nitrogen as nitrogenous fertilizers in the form of anhydrous ammonia or as solid compounds, such as ammonia or sodium nitrates, ammonium nitrate-limestone mixtures, ammonium sulfate, ammonium phosphates and urea. This expansion program progressed through three stages.

The first stage provided 244 *thousand annual tons* without the incentive of accelerated tax amortization. This step included the rehabilitation of the Morgantown Ordnance

TABLE 5

Anhyrous Ammonia Plants in Operation At Start Of Expansion Program

Company	Location	Year first operated	Approx. Capacity (tons/year)
Allied Chemical & Dye	Hopewell, Va.	1928	255,000
" "	South Point, Ohio	1942-44	200,000
Mathieson Chemical	Lake Charles, La.	1942-44	83,000
" "	Morgantown, W. Va.[1]	1942-44	175,000
" "	Niagara Falls, N. Y.	1925	7,000
Spencer Chemical	Pittsburg, Kans.	1942-44	160,000
" "	Henderson, Ky.	1942-44	70,000
DuPont	Belle, W. Va.	1926	200,000
"	Niagara Falls, N. Y.	1926	9,000
Lion Oil	El Dorado, Ark.	1942-44	200,000
Phillips Petroleum	Etter, Tex.	1942-44	130,000
TVA	Wilson Dam, Ala.	1942	90,000
Commercial Solvents	Monroe, La.	1942-44	59,000
Dow Chemical	Freeport, Tex.[2]	1950	33,000
" "	Midland, Mich.	1930	15,000
" "	Pittsburg, Calif.	1927	4,000
Mississippi Chemical	Yazoo City, Miss.[2]	1951	40,000
Shell Chemical	Shell Point, Calif.	1931	36,000
San Jacinto Chemical	San Jacinto, Tex.	1948-49	23,000
Hercules Powder	Pinole, Calif.	1940	12,000
Pennsylvania Salt	Wyandotte, Mich.	1932	12,000
			1,813,000

1—Leased from the Federal Government.
2—Plants certified under NPA expansion goals.

Works, some increase at the TVA plant, and expansion at four privately-owned facilities. This part of the program is about completed.

In the second stage, certificates of necessity were granted to 13 plants having a combined annual capacity of 556 *thousand tons* of nitrogen. Four of these plants with a total capacity of 88 thousand tons were completed and in operation prior to the beginning of the 1952-53 fertilizer season. Nine plants with a capacity of 469 thousand tons annually are to be completed. Two are scheduled for operation during 1952-53; the other seven are not expected to be completed until the 1953-54 season.

The third stage included 12 plants with an annual capacity of approximately *500 thousand tons* of nitrogen. Two of these are expected to be in operation for a part of 1952-53; the others are planned to come in during 1953-54.

There have been some dropouts in the program, too, but these were promptly replaced by other applicants. It is possible that some of the plants for which certificates were granted will not be built. In view of the interest in this field, it is believed that new or revived applications of other companies will be offered in replacement and that the nitrogen expansion goal will be achieved.

In tons of N, this expansion will bring the total annual production of anhydrous by 1916 to 3,098,000 tons. Table 4 shows by years the total scheduled anhydrous production through the completion of the expansion program of 1956. A complete list of the anhydrous plants now in operation is shown by Table 5 while a tabulation of the anhydrous plants proposed is included in Table 6.

Solid Nitrogen

TABLE 7 sets forth the planned additional *solid* nitrogen by years. A complete listing of the proposed new facilities, by products, is shown in Table 8.

Table 7 shows that by 1955 there will be additional production of 711,000 tons of solid nitrogen. Even though this is more than the U.S.D.A. suggested increase of 685,000 tons, it is expected that the ultimate expansion of solid nitrogen will provide over 750,000 additional tons of N a year.

Table 8 lists the actual companies that will produce this nitrogen by products, giving the total additional tonnage expected for each

(*Continued on Page 121*)

TABLE 6

Ammonia Plants Certified By DPA Under Expansion Program

Company	Location	Amount Certified	Per Cent
Nitrogen Division	South Point, Ohio	$ 7,270,000	50
Nitrogen Division	La Platte, Neb.	24,450,000	45
American Cyanamid Co.	Avondale, La.	47,745,000	50
Atlantic Ref. Co.	Point Breeze, Pa.	3,400,000	50
Commercial Solv. Co.	Sterlington, La.	20,458,000	50
Coop. Farm Chem. Assn.	Lawrence, Kans.	13,818,000	45
Deere & Co.	Pryor, Okla.	17,500,000	45
Delta Chem. Corp.	Buras, La.	8,892,000	45
Dow Chem. Co.	Freeport, Tex.	4,316,000	50
W. R. Grace & Co.	Memphis, Tenn.	15,466,000	45
Hooker Electrochem	Tacoma, Wash.	1,894,000	50
Lion Oil Co.	Luling, La.	30,452,000	50
Mathieson Chem. Co.	Lake Charles, La.	411,000	45
Mathieson Chem. Co.	Lake Charles, La.	1,388,238	50
Mississippi Chem. Corp.	Yazoo City, Miss.	7,212,446	45
Mississippi Chem. Corp.	Yazoo City, Miss.	5,704,707	50
Pacific Chem. Co.	Pasco, Wash.	5,735,000	45
Penn. Salt Mfg. Co.	Wyandotte, Mich.	2,400,000	50
Phillips Chem. Co.	Houston, Tex.	28,000,000	50
San Jacinto Chem. Co.	Houston, Tex.	1,000,000	45
Shell Chem. Corp.	Ventura, Calif.	10,000,000	50
Spencer Chem. Co.	Vicksburg, Miss.	13,758,000	50
Monsanto Chem. Co.	Texas City, Tex.	16,800,000	45

Total capacity of above plants about 1,047,000 tons of N.

Ammonia Plants Certified For Nitraphosphate Production

Gulf Improvement Co.	Pascagoula, Miss.
Nitrogen Division, Allied Chem. & Dye Corp.	La Platte, Neb.

TABLE 7

Planned Additional Solid Nitrogen Production In Tons of N.

	2nd Hf 1953	1st Hf 1954	2nd Hf 1954	1955	Total Tonnage Cert.	U.S.D.A. Suggested Increases
Am. Nitrate	21,000	38,000	86,000	222,000	222,000	160,000
Am. Sulphate	15,000	22,000	31,000	90,000	90,000	110,000
Urea			56,000	197,000	217,000	175,000
Am/Phos. and Nit/Phos.	23,000	36,000	50,000	202,000	225,000	240,000
	59,000	96,000	223,000	711,000	754,000	685,000

Note: Facilities to produce approximately 10,000 tons of N. from other solid forms have also been certified.

TOO MANY BILLS!

EACH year bills posing serious threats to the agricultural chemicals industry are introduced in various state legislatures. In addition to the usual bills relating to state insecticide, fungicide and rodenticide acts, there are also proposals covering such matters as state production, distribution, and/or application of pesticides at cost, restriction of pesticide sales to registered pharmacists, prohibition of the sale or use of certain materials, and open disclosure of trade secrets.

State control of pesticides dates back over 60 years. The first insecticide act was passed by the General Assembly of Louisiana in 1890 and covered only paris green. The second act was passed by New York state in 1898. Since that time there has been no rest for the weary manufacturer of pesticides as the various states went galloping off in all directions in their efforts to regulate this new but expanding industry.

As the years went by and more and more laws were passed, the pesticide manufacturer found it increasingly difficult to operate because of the divergent and, sometimes, contradictory requirements of the various state laws. These conflicts existed not only between the laws of different states but also at times within a single state.

The problems posed by the conflicting and divergent requirements of the state insecticide and fungicide laws prompted the National Agricultural Chemicals Association (then known as the Agricultural Insecticide and Fungicide Association) in 1941 to make the handling of state legislation an official part of its program.

While much was accomplished by the Association and others through their individual efforts, the situation gradually worsened. The Council of State Governments summarized the situation in 1946 in the following words:

> "State laws and regulations governing insecticides and other economic poisons vary greatly from state to state. Frequently it is difficult for a manufacturer to prepare a label which will meet federal and state requirements. If he has national distribution, several different labels for the same product may be required to comply with the rulings of different states. At the same time, different states may have different requirements as to the coloring of white insecticides and other poisons which are highly toxic. All this places a heavy burden on manufacturers who operate in more than one state. The cost of doing business is increased, resulting ultimately in higher prices to the people of the state."

Model Bill Developed

AT the request of the National Association of Commissioners, Secretaries and Directors of Agriculture, the Council of State Governments set out to develop a model law which could be enacted by those states which felt the need for legislation in the pesticide field. After long and careful study and consultation with interested parties, including federal agencies, state enforcement officials and industry representatives, the Council issued in 1946 its proposed State Insecticide, Fungicide and Rodenticide Act as suggested legislation for 1947 and subsequent years. This proposed act is commonly known in the pesticides field as the Uniform State Insecticide, Fungicide and Rodenticide Act, the Uniform State Act or the Model Bill.

One of the announced purposes of the Uniform State Insecticide, Fungicide and Rodenticide Act was "to help bring about the establishment of uniform state and federal requirements for the marketing of these materials." It served this purpose in a very satisfactory manner as it operated harmoniously with the Federal Insecticide, Fungicide and Rodenticide Act and was enacted by many states to supplement the federal act at the state level.

Unfortunately, many are losing sight of this objective of uniformity. Many are looking upon the Act merely as a rough draft of something which is to be modified to suit individual preferences and tastes. There is a real danger that if this concept should be reflected in legislation, we will revert to the situation of some ten years ago when neighboring states had conflicting requirements and thus made it difficult for the industry to get its vitally-needed products to the growers. This situation may also come about if certain other proposals to control pesticide sales and use should ever become law.

Most, but not all, of the proposals to regulate the agricultural chemicals industry and its products may be classified under eight general types of legislation, each characterized by certain issues or threats to the industry.

One of the main objectives of the NAC legislative program is the coordination and simplification of controls over the sale and use of pesticides. In furtherance of this objective, the Association has developed a definite position on each of these various types of legislation.

Some issues involved in State Legislation

by
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Insecticide Acts

THIRTY-eight states now have some law specifically relating to the distribution and sale of some or all pesticides. However, many of these acts are old and of limited scope. Accordingly, every year sees several new proposals to amend existing laws or to enact a new law.

The controversial points most generally involved in this type of legislation are proposals for high registration fees, labeling requirements not in conformity with those of the Federal Insecticide, Fungicide and Rodenticide Act and which would require special labels, and the granting of excessive or arbitrary power to the administrative official.

NAC believes that the sale of pesticides should be properly regulated in the interests of the grower, the industry, and the public generally. Where such legislation is indicated, it favors the enactment of the Uniform State Insecticide, Fungicide, and Rodenticide Act as developed and released by the Council of State Governments. However, it opposes any major changes from the original text and it opposes the imposition of registration fees in excess of the amount necessary for adequate enforcement of the Act. The Association strongly objects to the imposition of tonnage taxes or stamp taxes as a means of collecting revenue.

Because of their fundamental importance, bills to enact new insecticide laws or to amend existing ones demand and receive from the NAC more time and attention than any type of legislation. Next in importance have been the pharmacy and poison laws.

Pharmacy and Poison Bills

IN many states, the sale of poison is regulated by a poison law, a pharmacy act, or both. In some states, these laws are combined into one Pharmacy and Poison Law. The features of these laws which are important from the industry viewpoint are:

(1) Many products which are not considered to be highly toxic or to require poison labels under the Federal Insecticide, Fungicide and Rodenticide Act would have to bear poison labels to comply with the pharmacy and poison laws.

(2) Sales of poisons, as defined by these laws, are generally restricted to registered pharmacists. Since many pesticides are considered to be poisons within the definition of the laws, their sales could be and have been restricted to registered pharmacists.

The first feature is objectionable since it requires labeling, but the second is far more important since the whole administration set-up of the Industry could be destroyed.

The NAC position on this type of legislation:

(1) The sale of pesticides should not be subject to the pharmacy and poison laws; they are properly regulated under the federal and state insecticide, fungicide and rodenticide acts.

(2) The sale of pesticides should not be restricted to registered pharmacists; the standard channels of distribution and sales best serve the growers' interests and should be maintained.

NAC seeks to have a provision exempting pesticides incorporated into all pharmacy and poison laws and has been outstandingly successful in this regard.

Livestock and Animal Remedies Acts

SOMEWHAT similar problems are posed by the so-called Livestock and Animal Remedies Acts.

The primary purpose of these acts is the regulation of the labeling and sale of drugs and medicines intended for animal use. However, the definitions of the terms "animal remedies" and "livestock remedies" are sometimes worded in such a manner that all products intended to control external as well as internal parasites or pests are included. Under such conditions, pesticides intended for application to animals for the control of flies, ticks and other external pests fall within the definition of "livestock remedies."

Classification of insecticides as livestock remedies poses new problems for pesticide manufacturers in the form of special labeling, extra fees, and possible restriction on channels of distribution.

NAC believes that pesticides intended for external application to livestock, poultry and other animals properly are regulated under insecticide and fungicide acts and should not be subject to livestock and animal remedies acts. It seeks to have pesticides exempted from such laws before enactment or to secure an administrative ruling that products subject to the state insecticides act are exempt from the livestock remedies act.

Government Production and or Distribution

ANOTHER perennial type of legislation which sprouts in different forms each year, is that which would put some state or state agency in the pesticide business.

These bills frequently provide that the insecticides be manufactured or formulated in penal institutions. Proposals vary from producing merely enough to take care of the needs of the various state agencies all the way up to supplying the total needs of

(*Turn to Page* 143)

Herbicidal Use of
Phenyldimethylurea

TABLE 1

Observations on vegetation in 100 sq. ft. plots sprayed with phenyldimethylurea at Manhattan, Kansas, ten months after an October treatment

Pounds per acre phenyldimethylurea applied	Bindweed	Other Vegetation
10	Heavy growth	Heavy grass cover, predominantly crabgrass and purple top
20	21 plants	90 percent cover, primarily fox-tail and crabgrass
40	3 plants	90 percent cover, mostly crabgrass
80	0 plants	90 percent grass cover
160	2 plants	80 percent cover

TABLE 2

Chemical analyses of soil 16 months after treatment with phenyldimethylurea at Manhattan, Kansas

Pounds per acre phenyldimethylurea applied	Pounds per acre found at soil depth of 0-4"	4-8"	8-12"	Total
25	.03	0	0	.03
100	.07	.03	.5	.60
400	.3	.44	.57	1.31

TABLE 3

Chemical analyses of soil 10 months after treatment with phenyldimethylurea at Manhattan, Kansas

Pounds per acre phenyldimethylurea applied	Pounds per acre found at soil depth of 0-3"	3-6"	6-9"	9-12"	Total
10	.1	.02	0	0	0.12
20	.1	.2	.3	.3	.9
40	.1	.1	.4	1.6	2.2
80	.07	.5	1.1	1.2	2.87
160	.2	1.1	2.8	.8	4.9

FIELD tests by du Pont personnel in a number of states have shown 3-phenyl-1,1-dimethylurea (phenyldimethylurea) to be a herbicide specifically promising for the control of deep-rooted perennial weeds. The requirement for such a chemical for use in croplands is that it will kill deep-rooted perennials, yet be reduced to innocuous levels in the soil in a reasonable period of time.

Chemical and Toxicological Information

PHENYLDIMETHYLUREA is a white, crystalline compound having a melting point of 127°-129° C. It is sparingly soluble in hydrocarbon solvents and is soluble in water at 24° C to the extent of 0.29 per cent. Acute oral toxicity determinations on white rats reveal an approximate lethal dose (ALD) of 7500 mg./kg. The inclusion of phenyldimethylurea in the diet to the extent of .05 per cent for 90 days had no apparent adverse effect on white rats.

Field Test Results

FIELD bindweed (*Convolvulus arvensis*) is one of the most serious noxious weeds of the central U.S. Field tests on this weed treated at various times of the year have been encouraging. For example, at Manhattan, Kansas, plots heavily infested with bindweed were sprayed in June 1950 with 25, 100, and 400 pounds

by
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per acre of phenyldimethylurea. The formulation used was an 80 per cent water dispersible powder. Observations the following year showed good bindweed control at the two higher rates. Two years later, the 25 and 100 pound per acre plots were completely covered with vegetation other than bindweed, while the land receiving the 400 pound per acre treatment was 50 per cent covered.

The following observations were made ten months after a treatment applied in October on bindweed plots at Manhattan, Kansas.

Two years after treatment, bindweed had reappeared in plots receiving less than 80 pounds per acre.

Control of bindweed was also tested in plots established near Stockton, California, in March. Rates of 10, 20, 40, and 80 pounds per acre of phenyldimethylurea were used. Three and five months after treatment the bindweed was present but stunted in the 10-40 pound per acre plots, but had disappeared from the 80 pound per acre plots.

Kansas and California tests show phenyldimethylurea to be of promise also for quack grass control. Quack grass infested plots near Manhattan sprayed in November with 10, 20, 30 and 40 pounds per acre of phenyldimethylurea were inspected the following May. A 50 per cent kill was observed in plots receiving 10 pounds per acre, while 98, 99 and 100 percent control resulted in the 20, 30 and 40 pounds per acre treatments, respectively. The presence of crabgrass on all plots indicated the movement of the phenyldimethylurea from the surface layer.

In another test made at Garden City, Kansas in September, 20, 40, 60 and 80 pounds per acre of phenyldimethylurea were applied to quack grass. Control with the two higher rates was 99-100 per cent. On a silty clay loam with high organic content in Russell County, Kansas 40, 60 and 80 pounds per acre applications of phenyldimethylurea eliminated quack grass.

Good control of quack grass growing on a clay loam soil at Tulelake, California, was obtained with 80 pounds per acre of phenyldimethylurea. Partial kill resulted from the 40 pound per acre treatment.

Experiments on Johnson grass in Kansas, Louisiana, and Texas indicate the potential value of phenyldimethylurea in controlling this weed in cropland. Johnson grass plots in south Louisiana sprayed with 80 pounds per acre of phenyldimethylurea in September were 99 per cent free of this weed the following May. In plots sprayed in December control of Johnson grass with phenyldimethlurea five months later was as follows: 40 pounds per acre — 45-50 per cent; 80 pounds per acre — 95-100 per cent; 160 pounds per acre — 100 per cent. In western Kansas and south Texas application of 80 pounds per

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TABLE 4

Chemical analyses of soil 12 months after a June treatment with phenyldimethylurea at Newark, Delaware

Pounds per acre phenyldimethylurea applied	Pounds per acre found at soil depth of 0-4"	4-8"	8-12"	Total
16	.10	.04	.05	.19
32	.25	.05	.03	.33
64	.75	.07	.05	.87

TABLE 5

Chemical analyses of soil six months after a June treatment with phenyldimethylurea at Bradenton, Florida

Pounds per acre phenyldimethylurea applied	Pounds per acre found at soil depth of 0-3"	3-6"	6-12"	Total
10	.58	.36	.28	1.22
20	.67	.13	.32	1.12
40	.28	.08	.22	.58
80	1.47	.53	.50	2.50
160	.64	2.83	.38	3.85

TABLE 6

Chemical analyses of soil 11 months after a March application of phenyldimethylurea at Baton Rouge, Louisiana

Pounds per acre phenyldimethylurea applied	Pounds per acre found at soil depth of 0-4"	4-8"	8-12"	Total
10	.3	.09	.03	.42
20	1.2	.4	.09	1.69
40	1.8	.3	.01	2.11
160	3.06	.7	.3	4.06

Nitrogen Division places on Market its high-analysis

GRANULAR 12-12-12

MARKETING of its new 12-12-12 granular fertilizer is expected to begin in October, by the Nitrogen Division of Allied Chemical & Dye Corp., New York. The new product, known as "Arcadian 12-12-12", will be distributed mainly through the midwest, but its application will also include the middle Atlantic states. According to Fred T. Techter, executive vice-president of the Division, the new high-analysis material will be produced by a continuous, all-chemical process in the firm's $5 million plant now nearing completion at South Point, Ohio. The new plant, utilizing a process developed through five years of research, is the first of its type in the United States.

Describing the continuity of manufacture, the Division explains that ground phosphate rock is continuously mixed with nitric, phosphoric and sulfuric acids. After preliminary digestion, these acids are neutralized with anhydrous ammonia to produce fertilizer salts such as ammonium nitrate, ammonium phosphate, ammonium sulfate, etc. At certain points in the processing, potash salts are added and become chemically integrated with the other nutrients to produce a chemically-stable and highly-available mixture of N-P-K. The product is then dried to about 1% moisture, screened, and cooled before going to storage.

Through the screening process, over-sized particles are removed, then remilled and returned with under-sized particles for further refinishing. In its final form, the granulated particles will pass through an 8-mesh screen, but not through a 30 mesh screen.

By substituting nitric acid for a large portion of sulfuric acid, advantage is taken of the presence of nutrient nitrogen in the nitric acid. The nitric acid also converts phosphate rock efficiently into forms of phosphate readily available to plants.

In the process, the makers explain, the fertilizer becomes stabilized as all of the chemical salts are fully reacted while in solution form. After drying, there is no tendency for the salts to undergo double decomposition with attendant recrystallization, a cause of caking in dry mixed fertilizers.

Among the chemical and physical properties of the granulated fertilizer product, the Division lists its bulk density as 69 pounds per cubic foot; its crushing strength per granule at 10 lbs. Regarding hygroscopicity, it begins to absorb moisture at 52-53% relative humidity at 95° F. Accordingly, the makers point out that although the 12-12-12 will absorb moisture slowly in humid air, it may be shipped in bulk. Like all other high-analysis fertilizers made of readily-available plant foods, 12-12-12 has the property of taking up water quickly when added to moist soil and its soluble constituents become part of the soil solution.

The material will not burn with a flame, the company states. However, the material can be partially decomposed by the heat of a flame. Such decomposition, however, is slow and non-violent, but will propagate itself through the mass unless quenched by water.

Corn Largest User

ACCORDING to Walter S. Colvin, northern district sales manager for the Division, with headquarters at Indianapolis, the greatest application of the high analysis product is expected to be on corn. The fertilizer will be applied at planting time at rates ranging from 150 to 300 pounds per acre, or in bands from six to ten inches deep, or applied and plowed under.

Second in importance are small grains. In late-seeded wheat, for instance, the 1-1-1 ratio gives better stand, better growth and less winter injury because of the increase of nitrogen over conventional applications.

Other crops expected to make use of the high-analysis plant food, are truck crops, fruit orchards and pasture lands. From 500 to 600 pounds per acre are indicated for use on pastures.

Packed in 80 pound bags, the 12-12-12 will be distributed through normal channels of trade, it is indicated. The product will also be available in bulk form, with facilities for loading trucks having been incorporated in the building.

Mr. Colvin expressed his belief that the granular form of this new fertilizer and its particular combination of properties may help even out production and distribution schedules since users will be able to buy in the slack season without fear of the fertilizer's caking before time to apply it.

(Above) Aerial view of Nitrogen Division's South Point, Ohio, plant where the new 12-12-12 is manufactured. The plant also produces nitrogen fertilizer solutions, urea feed supplements and other urea products.

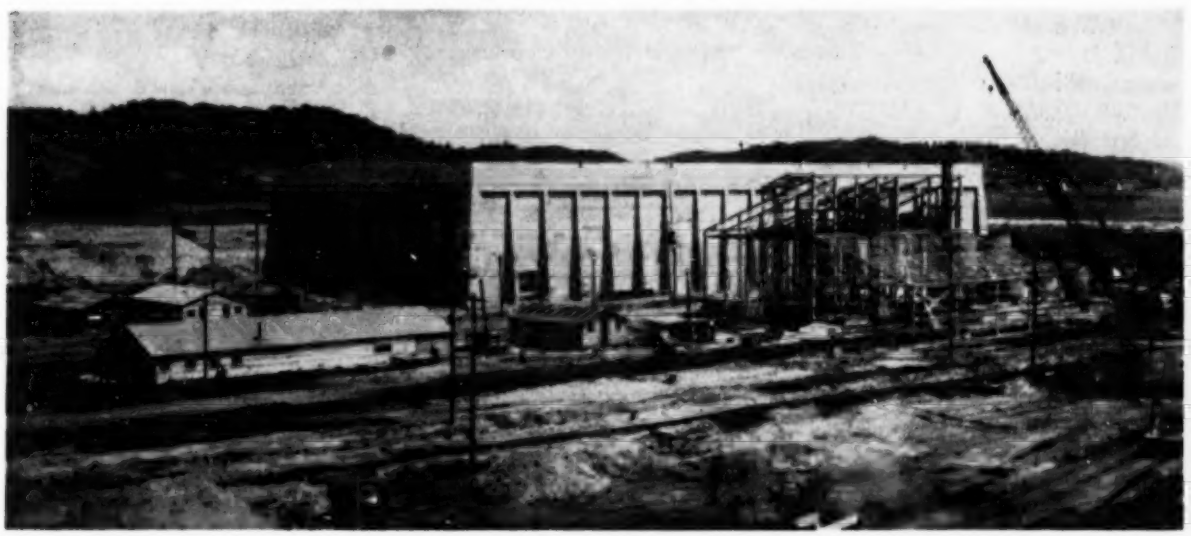
Predecessor groups which later became the Nitrogen Division, were pioneers in the development of processes for synthesizing ammonia. Just before World War I, when the need for greater supplies of N were increasingly apparent, this research group turned over to the Government its successful plans, equipment, material and entire personnel. This project became a unit of U.S. Nitrate Plant No. I. at Muscle Shoals, Ala. In September, 1918, this plant produced the first synthetic ammonia ever made in the U.S. The plant shut down after the war, but was later reactivated as part of the Tennessee Valley Authority.

Allied Chemical, in 1920, built the first entirely successful synthetic ammonia plant in the U. S. It ran for ten years, and then, based on experience gained here, the company built the first units of a much larger plant at Hopewell, Va., completed in 1928. By 1930, output was 200,000 tons of ammonia per year, largest in the world outside of Germany. It was the first plant to make America independent of foreign sources of supply.

Facilities were expanded just before Pearl Harbor and in 1941, the firm began construction of an ammonia plant for the Government at Henderson, Ky. The plant at South Point was begun later.

The firm also has under construction a new plant near Omaha, Nebraska, which will have an initial capacity to produce about 60,000 tons of ammonia per year. These projects now under way will involve a capital expenditure of more than $50 million, the company reports.

Photo below: Part of fertilizer plant and storage building during construction at Nitrogen Division's South Point, Ohio, plant. Storage building is large enough to hold a football field and bleachers.



Chicago meeting of ACS presents numerous papers on agricultural chemicals:

Insecticides Herbicides Fungicides Fertilizers

FERTILIZERS, insecticides, rodenticides, fungicides and weed killers were subjects of discussion at the American Chemical Society meeting at Chicago, Ill., September 6 to 11. According to the advance program, several sessions were held covering these materials.

F. A. Gunther was chairman and J. L. St. John, secretary, of a symposium on Rodenticides, September 8. Justus C. Ward presided. The subject of chemical repellents in rodent control was covered by Jack F. Welch, U. S. Department of Interior, Denver, Colo. His paper stated that some 4,000 chemicals have been examined in search of effective repellents. Tests have been made covring food acceptance, barrier tests and simulated and actual field tests. Certain chemical groups such as amines, nitro compounds, disulfides and various other classes containing nitrogen, sulfur, or halogens have been found repellent to the Norway rat and efforts are being made to establish the most effective materials and optimum methods for its application, he said. Of compounds tested, an antibiotic, "Actidione", has been most effective. Its toxic properties, however, make it useful only as a standard of comparison for other potential repellents, he explained.

Complexes with trinitrobenzene, principally the aniline and O-anisidine derivatives, have been particularly effective. Other promising compounds include commercially available materials such as zinc dimethyldithiocarbamate cyclohexylamine complex, thiuram disulfide and hexachlorophene.

He concluded with the statement that further work is needed to determine the suitability and best method of incorporating these chemicals in packaging and other materials for optimum protection against rodent attacks.

Ralph E. Heal, National Pest Control Association, Brooklyn, N. Y., presented a paper on "Rodenticides and their Economic Importance in Controlling Economic Damage". He pointed out that economic damage from rats and mice may result from consumption, pollution, and waste of foods; from gnawing of structures, packages, and commodities in search of food, harborage, or nesting materials; from attack on domestic animals; from destruction of growing crops; and from a variety of unique happenings associated with rodent activities. Estimates for the United States place a cost of over one billion dollars annually on this damage.

Rodenticides have constituted the major measure for reduction of rodent populations, although a balanced control program should include, in addition, all economically feasible measures of sanitation and rodent-proofing. Available rodenticides vary greatly in speed of action and degree of hazard associated with their use.

Authors of papers represent producers of all types of agricultural chemicals. New materials reported to be in the offing for early marketing, according to papers

They range from the highly and rapidly effective but hazardous sodium fluoroacetate (1080) to the more slowly effective anticoagulant rodenticides of low toxicity hazard. None is perfect.

Limitations must be observed for effective, economical, and safe use of each. A broad field of use awaits the development of more effective and safer rodenticides which can be used in conjunction with a broader application of rodent-control principles to reduce the losses from rodent spoilage. Much remains to be accomplished, as evidenced by approximately 200 cases of food adulteration from rodent filth judged in our federal courts in the past years.

"Chemical Problems Encountered in Developing an Anticoagulant Rodenticide" were covered in a paper by three authors, all of the Wisconsin Alumni Research Foundation, Madison, Wis. They are Carl H. Krieger, Francis B. Coon and Earl F. Richer. After prefacing their remarks by a brief summary of the development of warfarin, the authors stated that the physiochemical assay of warfarin in 0.5% concentrates has presented no problem. Difficulties in the assay of 0.025% warfarin finished baits, due to variable and ofttimes unavailable blank materials, have been minimized by use of a chromatography step in the assay procedure (LaClair, *J. Assoc. Offc. Agr. Chemists*, in press). However, application of the LaCair procedure to pelletized baits yields low results. Employing the Eble, Richter, and Coon procedure (unpublished) including the chromatography step, allows for 90 to 100% recovery of warfarin in pelletized baits. The latter has been confirmed by biological assay means. The assay of warfarin in animal tissues is encumbered with difficulties due to the extremely small quantities present as well as the variable nature of interfering materials.

Recently two other anticoagulant rodenticides, Tomorin and Pival (the latter has been registered for general use), have received considerable attention, the authors reported. Data was also presented as to the comparative biological effectiveness of the three anticoagulant rodenticides.

Continuing the discussion on rodenticides, Alfredo N. Bica, Pan American Sanitary Bureau, Washington, D. C., presented a paper on their relationship to control of bubonic plague. Since the rat is the chief source of human plague, control of the disease depends upon eradication or greatly reducing the domestic rodent population, he pointed out. Both suppressive and destructive methods are used, with the former a more permanent control since it prevents rats from reaching food and denies them harborage. Destructive measures are designed to destroy the individual rat by poison, trapping, fumigation or by natural enemies. The most effective methods combine both means of rodent control.

Since there is no single ideal rat poison covering all conditions, it is necessary to study the particular characteristics of each of the rodenticides in order to select those most likely to give best results under the specific conditions involved.

That rats are an important factor in spreading diseases to man, was emphasized by Carl O. Mohr, U. S. Public Health Service, Atlanta, Ga., in a paper, "Rodenticides in the Public Health Programs in the United States." He reported on the use of rodenticides when outbreaks of rat-borne diseases occur or threaten.

In the past, he pointed out, three extensive outbreaks of rat-borne diseases have required widespread use of rodenticides: plague in cities along the west coast early in this century and in several Gulf coast cities between 1914 and 1921, and murine typhus fever in the southeastern states beginning about 1942.

About 5400 cases of murine typhus fever were reported in 1945. Perhaps an equal number was unreported. Between 1945 and 1951, a total of 1,564,980 premises was reported treated with rodenticides through cooperative state-federal programs to reduce this outbreak. Fewer than 200 cases were reported in 1952.

State, county, and city health departments suppress rats and rat-borne diseases by appropriate inspection and enforcement of basic sanitation and rat-free condition of premises, using rodenticides where local outbreaks occur.

Fungicides Discussed

WITH Dr. J. L. St. John presiding, a session on pesticides Wednesday morning featured a number of papers on fungicides and herbicides. A paper by Dr. F. L. Howard, Rhode Island Agricultural Experiment Station, Kingston, R. I. and D. J. Frese, Mallinckrodt Chemical Works, St. Louis, Mo. told of developments in cadmium fungicides. The paper said that an exploration of the substitution of cadmium for mercury in fungicides to increase their safety for plants and animals without sacrifice in fungitoxicity was begun about 10 years ago. Laboratory data on 40 inorganic and organic com-

pounds serve to illustrate comparative toxicity engendered by molecular structure and physical properties. Field tests have confirmed the efficacy of cadmium fungicides for particular uses, the paper declared.

"A study on the Vapor Movement of Dinitro o-sec-butylphenol as a Pre-emergence Herbicide" was the title of a paper authored by J. D. Eastman, G. E. Lynn and K. C. Barrons, Dow Chemical Co.

The paper reported that during early May of 1952, cotton seedlings in many fields in the South given a pre-emergence treatment with formulations of dinitro-o-sec-butylphenol (DNOSBP) showed extensive hypocotyl lesions and cotyledon injury to an extent never before encountered. This prompted a study of the nature of the injury and possible preventive measures. Biological tests showed that under certain conditions, dinitro-o-sec-butylphenol can move through the atmosphere in concentrations sufficient to injure, and on occasion kill, young cotton plants.

A method was developed for the quantitative determination of the amount of dinitro-o-sec-butylphenol volatilized from soil following pre-emergence herbicide applications. It was discovered that more dinitro-o-sec-butylphenol was lost when water vapor was present, indicating a water vapor distillation phenomenon. Control of available free phenol by the use of excess lime and other alkalies lessened the amount vaporized. These results can be best explained on the basis that the high concentration of alkali ions in a very thin zone of the soil pushes the nitro-phenol-salt equilibrium towards the salt which is not water vapor-distillable. Biological tests show that injury to cotton seedlings is lessened by decreasing the amount of dinitro-o-sec-butylphenol vaporized.

That plant pathologists are interested in the selective action and activity of antibiotics, was explained in a paper, "Antibiotics and Plant Diseases" by Curt Leven and G. W. Keitt, University of Wisconsin, Madison. Under experimental conditions, numbers of each type of causal agent have been inhibited by antibiotics, they reported. Successful plant disease control in field tests has also been reported using antifungal and antibacterial antibiotics for foliage sprays or for seed treatments, purposes for which most of the plant disease chemicals are now employed. Certain antibiotics have been shown to control disease by moving systemically in the plant, a property with inherent advantages over the immobile type of surface toxicant now used extensively.

Factors that will govern the use of antibiotics on a wide scale include effectiveness in given disease situations, particularly those where present control measures are poor or non-existent, freedom from toxicity to plants and animals, cost and availability, mode and cost of application, compatibility with insecticides, and stability with time and to such weathering agents as light or the washing of rain.

Fertilizer Sessions

MANY phases of fertilizer technology, including a discussion of fertilizer-pesticides mixtures, were on the program. A. L. Mehring was chairman and G. H. Serviss, secretary, of a paper-reading program Wednesday afternoon. A paper by R. D. Kralovec and W. A. Morgan, E. I. duPont de Nemours & Co., Inc., Wilmington, Del., was entitled "Urea-Formaldehyde Condensation Products for Fertilizer Applications." The paper pointed out that urea and formaldehyde can be condensed to form novel and useful nitrogen fertilizers with controlled availability for plant growth. "Uramite" urea-formaldehyde fertilizer compound is such a composition. It was described as a well-granulated material containing about 38% N, of which three-quarters is in the slowly-available form, generally referred to as water-insoluble nitrogen.

"Uramite" is made by the acid-catalyzed reaction of urea with formaldehyde. By controlling the reaction conditions, the paper said, a product can be made that exhibits 55 to 60% nitrification of insoluble nitrogen in 6 months in an average soil. The rate at which "Uramite" nitrifies is affected by the type, pH, and other plant nutrient content of the soil. Of these variables, soil type has the greatest effect.

The authors pointed out that "Uramite" is an "exceptionally safe nitrogen fertilizer." With it, single applications may be made at higher nitrogen levels than are possible with the soluble sources; a full year's nitrogen supply may be applied at one time. It is ideally suited for turf and other long season crops, greenhouse plants and crops grown in irrigated or high rainfall areas, they declared.

R. W. Way and E. L. Nelson, Nitrogen Division, Allied Chemical and Dye Corp., Hopewell, Va., reported on the "Effect of Sodium Salts on Phosphate Reversion in Mixed Fertilizers." Their paper reported that inclusion of small amounts of inorganic sodium salts in bench scale preparations of nitrogen-phosphate and nitrogen-phosphate-potash fertilizers inhibited the formation of citrate-insoluble phosphorus pentoxide. The effect was more apparent when the sodium salt was added to phosphate rock before acidulation than when it was added to the superphosphate just prior to ammoniation.

Batches of 6-9-6, 10-11-10, 6-13-6, and 8-17-16 fertilizers were prepared by ammoniating superphosphate mixtures at 5- to 7-pound rates. Varying amounts of sodium were added as sodium nitrate just prior to ammoniation. The sodium caused a marked decrease in the build-up of unavailable phosphorus pentoxide during hot, moist storage, especially in the 6-13-6 set. In this set, as the sodium increased from 0.1 to 1.2%, the unavailable phosphorus pentoxide decreased from 19 to 11%.

Nitrogen-phosphate fertilizers were prepared by ammoniating superphosphate at a severe 7-pound rate. Various amounts of sodium nitrate, sodium chloride, sodium sulfate, and sodium fluoride were added just prior to ammoniation. The sodium decreased the formation of unavailable phosphorous pentoxide during moist storage at 80°C. for 30 days. For example, in the sodium nitrate set, as

(*Turn to Page 65*)

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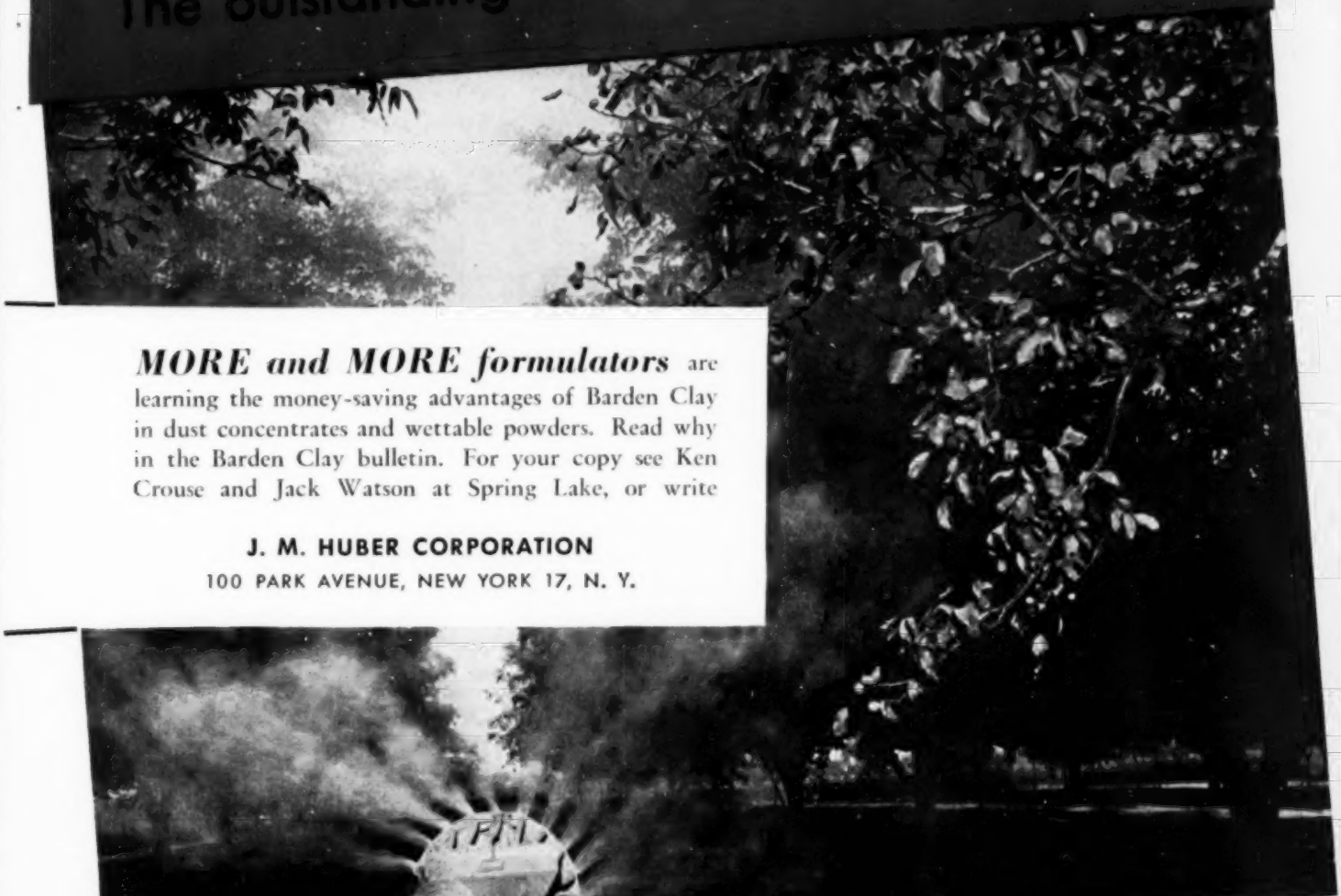

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the sodium increased from 0 to 2% the unavailable phosphorus pentoxide decreased from 21.4 to 8.8%.

Batches of Florida rock phosphate containing various amounts of sodium nitrate, sodium chloride, sodium sulfate, and sodium fluoride were acidulated with 60% sulfuric acid. Portions of the resulting superphosphates were ammoniated and stored in the same manner as the mixture listed in the preceding paragraph. Sodium caused a very marked decrease in reversions. For example, in the sodium nitrate set, as the sodium increased from 0 to 2% the unavailable phosphorus pentoxide decreased from 21% to a very low 0.6%.

The Effect of Surface-Active Agents on Preparation of Superphosphate and Mixed-Goods Fertilizers was explained in a paper by Peter G. Arvan and Robert P. Langguth, Phosphate Division of Monsanto Chemical Co., Dayton, Ohio. They pointed out that the preparation of superphosphate and mixed-goods fertilizers entails the reaction of liquid and solid ingredients under such conditions that the final products can be obtained as dry, granular solids. The operating schemes employed are designed to avoid the formation of physical systems from which large amounts of water must be removed in order to obtain solid materials. However, some water is needed to form an aqueous phase which serves as a medium for intimate mixing of the reactants and therefore enables the final equilibria to be approached rapidly.

It is because of this imposed condition of low water content that the use of surface active agents expedites fertilizer manufacturing processes. The primary role of the surfactant is to increase the efficacy of the water present by lowering the surface tension of the liquid phase and possibly of the solid phase, thus permitting better contact and interpenetration of the two phases.

The paper concluded by describing the effect of surfactants on the efficiency of raw material utilization; the conversion of phosphorus pentoxide to available nutrient forms and physical properties of finished goods.

Three fertilizer experts from the U.S.D.A. Bureau of Plant Industry, Soils and Agricultural Engineering, Beltsville, Md., presented a paper on "Physical Factors Influencing the Ammoniation of Superphosphates" at a round table discussion on the use of surface-active agents. The authors, Rikio Kumagai, Herbert F. Rapp and John O. Hardesy reported that laboratory studies of the treatment of ordinary and triple superphosphates with anhydrous ammonia in a closed rotary cylinder showed that ammonia absorption increased with decrease in particle size, increase in moisture content and increase in ammoniation temperature. Ammoniation efficiency [(ammonia absorbed/ammonia added) x 100] was lowered by increasing the amount of ammonia added and shortening the reaction period.

They reported that a minimum moisture content of 2% was needed for satisfactory ammoniation of superphosphate, as evidenced by a sharp decrease in efficiency below that point. Increasing the moisture content from 3% to 7% gave an increase in ammonia absorption equivalent to that obtained by decreasing the diameter of the triple superphosphate particle from 3.0 to 1.7 mm. Application of external heat to raise the ammoniation temperature from 70° to 100°C. caused a 7% increase in absorption when triple superphosphate containing 5.4% moisture was treated with 5 pounds of ammonia per unit of phosphorus pentoxide. The reaction period was 4 minutes, except where otherwise noted. Increasing the amount of ammonia added from 2 to 5 pounds per unit of phosphorus pentoxide lowered the ammoniated efficiency of the triple superphosphate from 97 to 83%. The ammoniation efficiency of the triple superphosphate containing 6% moisture decreased from 98% when treated with the equivalent of 3 pounds of ammonia per unit of phosphorus pentoxide to 86% when treated with 7 pounds per unit. Varying the reaction period from 1 to 8 minutes in the treatment of ordinary superphosphate with 7 pounds of ammonia per unit of phosphorus pentoxide caused a corresponding increase in ammoniation efficiency from 72 to 88%.

New methods of quick-curing normal superphosphate have been carried out with success in pilot plant tests, it was reported in a paper by G. L. Bridger and Walter Drobot, Iowa State College, Ames. The process consists of mixing phosphate rock with 55% sulfuric acid instead of the usual 72% acid, disintegrating the fresh superphosphate from the den, and drying in a Roto-Louvre dryer at a product temperature of 275°F.

A pilot plant having a capacity of about 150 pounds of product per hour was operated over a wide range of conditions. The results of the laboratory investigation were borne out in the pilot plant study, and it was demonstrated that the process can be successfully carried out on this scale.

Dr. Bridger was also co-author with John L. Kearns, of another paper, entitled "Quick-Curing of Triple Superphosphate Made from Wet Process Phosphoric Acid." Since most domestic commercial triple superphosphate is made from wet process phosphoric acid, a study was made to determine optimum operating conditions of the process for this type of superphosphate, the authors said.

Wet process triple superphosphate was prepared and dried in a laboratory Roto-Louvre dryer. The following ranges of conditions were studied: acid concentration, 60 to 70% H_3PO_4, acidulation, 2.2 to 2.8 pounds of acid phosphorus pentoxide per pound of rock phosphorus pentoxide; inlet air temperature, 320° to 750°F.; acid temperature, 70° to 200°F. Fluid time determinations were also made by the trough method. Control experiments were made with electric furnace phosphoric acid.

Wet process triple superphosphates of acceptable quality (47% available P_2O_5) were made by quick-curing with drying air as high as 750°F. Conversion of phosphorus pentoxide was lower (80 to 85%) with wet process acid than with elec-

(*Turn to Page 145*)

Chicago Site of 1953 National Shade Tree Conference

by
H. H. Slawson
Agricultural Chemicals
Chicago Correspondent

IN its 29th annual meeting in Chicago, Aug. 17 to 21, the National Shade Tree Conference, devoted considerable attention to the problem of controlling diseases which threaten destruction of oak and elm trees in wide areas throughout the nation.

A report was made on a new canker disease which attacks Colorado blue spruce and other ornamentals. Still another program feature was an account of a blossom-thinning program as a therapeutic measure to build up the vitality of ailing shade trees. This was thought to offer prospect of a new and enlarged outlet for growth hormones.

At the final business session, A. W. Meserve, head of United Arborists, Danbury, Conn., was elected president for the 1953-54 term. Mr. Meserve, who has served as vice-president the past year, succeeds Dr. George Langford, entomologist at the Univ. of Maryland, College Park, Md.

For vice-president, the conference selected Carl Fenner, assistant city forester, Lansing, Mich., while Dr. L. C. Chadwick, Dept. of Horticulture, Ohio State Univ., Columbus, O., was named to continue as secretary-treasurer.

As the newest development in tree care processes, the report on blossom control for ailing trees, which is being practiced by the Lansing, Mich., forestry department, attracted the attention of many among the more than 600 arborists, park executives, college scientists and others at the Chicago meeting.

Explaining the theory which motivates this project, Theodore Haskell, of the Lansing forestry department, pointed out that an oak tree devotes tremendous energy to production of acorns but to no good purpose. If the seed forming process could be arrested by killing the flower before the fruit sets, he reasoned, all that lost energy could be conserved and utilized to enhance its growth with beneficial effects on the health of sick or injured trees.

He refered to work being done at Ohio State University on a National Shade Tree Conference fellowship, which is exploring blossom control on European ash, catalpa, horse chestnut, honey locust and eastern poplar. At Lansing, however, the project has been concentrated during the past year on elms and Norway maples, he said.

Dow Chemical Co's hormone spray, "App-L-Set," a sodium naphthalene acetate compound, was used, Mr. Haskell stated. Results were found to be governed by several variable factors, chief of which was time of application with relation to blossom development.

"You get only one chance a year," he remarked, "to obtain effective results from blossom control. On peach trees, for instance, orchardists have only two hours in the whole year." Development of leaves at time of spraying must be considered, he said, since the young, tender foliage is susceptible to injury by concentration of hormone sprays. Where flowers and leaves open at separate times, control is easy it was found, but where flowers and foliage open together, as in the Norway maple, foliage is easily injured.

"Progress in this class, said Mr. Haskell, "will depend on judicious use of low concentrations of the hormone sprays, or development of new chemicals that will allow higher concentrations with less chance of foliage injury."

In the ensuing floor discussion one realist asked "Why spend public funds just to keep tree seeds out of people's hair?" In Lansing, Mr. Haskell reiterated, the project is being conducted solely from the point of view of tree therapy.

In East Orange, N. J., problems have arisen with female gingko trees, the next speaker, Harry Turner, secretary of the Shade Tree Commission there, reported. Forty years ago this exotic ornamental was planted along six miles of boulevards, he related. They are beautiful the year round, but in the fall the ripening fruit emits a disagreeable odor.

Beating the fruit off with nail-studded clubs was slow and expensive and injured the trees. Using a mist sprayer, a chemical was applied in the spring, to burn off the blossoms before the fruit set, but the only result was severe foliage burn.

Finally a well known "chemical compound," commonly called "water" was used with good effect. Directing the stream through fire hose at a pressure of 90 pounds at the hydrant, this method brought the fruit down by the ton and after debris was raked up the residents of East Orange now once more enjoy the untainted brisk autumn air, he said.

On small trees, Mr. Turner stated, the water treatment was 95 percent effective, while on the larger ones, about 85 percent of the fruit dropped. The whole trouble, he insisted, is caused only by the fruit-bearing female gingko tree. Male trees, he said, make good street trees. They grow fast, and require little care.

Recent data from the Ohio State University's research project on blossom control, which had been re-

(*Turn to Page* 132)

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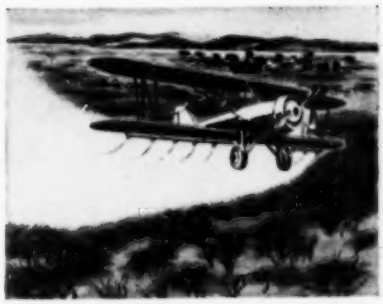

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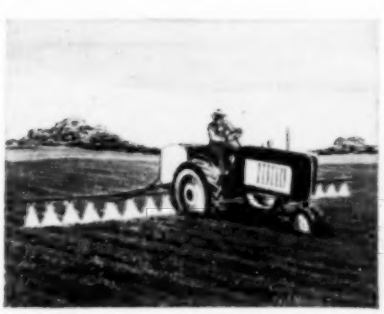

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has a common name "demeton"

SYSTOX is Chemagro's trademark name for a formulation of 0, 0-diethyl-0-2-(ethylmercapto)-ethyl thiophosphate, the remarkably effective systemic insecticide which was developed by Farbenfabriken Bayer, the inventor of parathion, and which Chemagro is licensed to manufacture in this country.

To make it easier for the many scientists who are experimenting with SYSTOX and who do not like to incorporate trademark names in their reports, the common name "demeton" is being used by Chemagro to designate the active ingredient of SYSTOX.

Chemagro therefore respectfully suggests the use of the common name "demeton" in scientific reports, rather than the use of the commercial trademark SYSTOX. If the word SYSTOX is so used, we request that a statement be included to the effect that it is a trademark of Chemagro Corporation.

We wish also to express our deep appreciation to the many agricultural scientists who are continuing to test demeton, and whose findings to date indicate that demeton is a revolutionary insecticide of great economic importance.

* REGISTERED TRADEMARK OF CHEMAGRO CORPORATION

CHEMAGRO CORPORATION

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FASTER FILLING IS AN EXTRA DIVIDEND WITH PYRAX ABB

The same superior qualities which make Pyrax ABB dusts more effective on the farm make Pyrax ABB a better diluent in the blending plant.

Pyrax ABB is non-hygroscopic . . . your blending and bagging goes faster even in damp air . . . your customers can dust in almost any weather.

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"In terms of beef and pork produced, 8-8-8 on pastures is a real investment"

—says Beryl Wayt, Michigantown, Ind.

Mr. Wayt applied 400 pounds of 8-8-8 complete fertilizer on a tract of Big English bluegrass and ladino clover in 1950, and it has been yielding excellent feed since. Without additional fertilizer, the 28-acre tract carried 65 hogs and 38 two-year-old cattle last spring. There was plenty of feed at all times and the grass was thick and rich.

Mr. Wayt says, "The last three years have convinced me that 8-8-8 fertilizer, in terms of beef and pork produced, is definitely an economical operation. I plan to refertilize the area with 8-8-8 again next spring."

Bigger yields for farmers mean better business for you

THE big yields that high-nitrogen fertilizers produce are the strongest argument in favor of their use. Farmers find they pay for themselves over and over again.

Results like this are pushing the demand for high-nitrogen complete fertilizers up and up. Meet this demand by giving high-nitrogen fertilizers a big spot in your sales program.

And for the best results, use U·S·S Ammonium Sulphate for a major part of the nitrogen content. It's a dry, free-running material that performs well in mixing as well as in distributing equipment.

For complete information on U·S·S Ammonium Sulphate, get in touch with our nearest Coal Chemical sales office or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

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UNITED STATES STEEL

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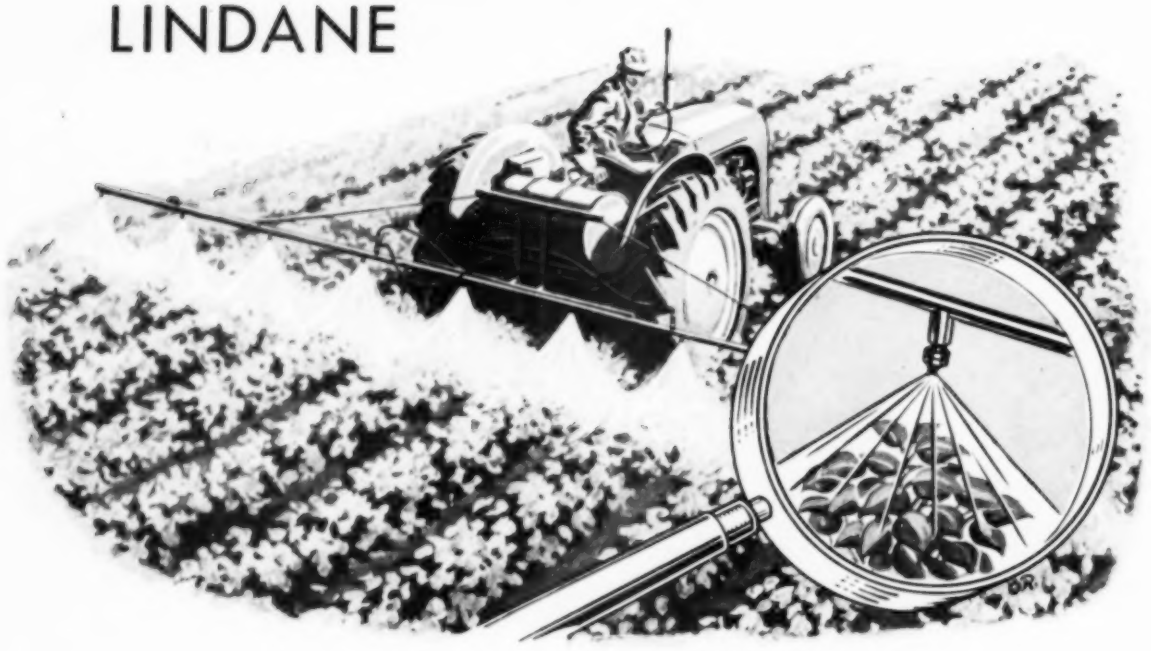

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When spray hits the plant, how effective will it be? Will it pay off big in clearing away the pests, protecting the crop, assuring bigger yields, bigger profits for your customers?

Lindane measures up to all these specifications. Lindane's triple-action . . . as a stomach, vapor and contact poison . . . means quick death to a wide range of pests that attack crops and livestock. It can be used as a spray, dust or dip in wettable powder suspensions or emulsion concentrates. It's long-lasting, thorough, economical . . . and climbing fast on the best-selling list of insecticides.

Learn more about this potent and popular insecticide and how you can put it to work for you. Write today for your copy of our new 30 page booklet "'Ethyl' Lindane." It's yours for the asking.

"Ethyl" Lindane
Yours for the asking!

In addition to LINDANE, Ethyl offers you the effective insecticides Extra High Gamma (80) BHC and BHC (technical), and the brush killers 2, 4, 5-T Acid and Esters.

ETHYL CORPORATION
Chemicals for industry & agriculture

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ETHYL
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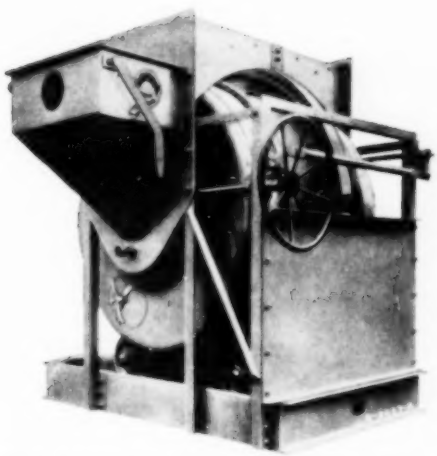
He can't stand that slow mixing cycle!



THE MODERN WORTHINGTON DRUM-TYPE FERTILIZER MIXERS are available in capacities of ½, 1, 2 and 3 tons.

But you don't have to go *that* far, chum. Give us a chance to help. We've got a mixer that can boost your daily output as much as 10%. It's the Worthington fertilizer mixer with an engineered blade design that gives the fastest mixing cycle we know of. You save time with every batch and can set up the mixer for continuous agitation. Mixing is thorough, too, and special mixer design eliminates these other big problems for you:

CORRODED DISCHARGE CHUTE—the Worthington discharge chute is out of the mixer during mixing time. Proper balance makes manual control of chute easy. Pneumatic controls are also available.

HARMFUL DUST SPREADING—the Worthington fertilizer mixer's charging and discharging chutes are designed for dustproof operation. A sealing disc attached to the discharge chute revolves with the drum to assure dustproof mixing.

HEAVY HORSEPOWER CONSUMPTION — Worthington's specially engineered anti-friction construction assures peak operating efficiency with lowest possible horsepower consumption.

WORTHINGTON

Industrial Mixers

SEND THIS COUPON TODAY to learn more about how to reduce mixing time and cost with a Worthington fertilizer mixer. There's a skilled Worthington engineer near your plant. At your request, he'll be glad to call on you.

Worthington Corporation
Industrial Mixer Division
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☐ I'd like more information. ☐ I'd like to talk with an engineer.

PROTECTION

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Tough—like an alligator's hide! **Fulton's W.P.P.L.** (Waterproof Paper Lined) **Bags** protect your product against the detrimental effects of moisture and odors—an economical, easy-to-handle textile bag built to do the job of a more costly rigid container. Your product is fully protected with an inner lining of plastic or crinkled Kraft paper laminated with special adhesives to either cotton or burlap which safely, surely seals in your product . . . nothing gets in—or out! For full details, write your nearest Fulton factory today!

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One way to be sure of producing a dry dust concentrate that will give top performance in the field is to use Celite in your primary grinds.

The presence of only a small percentage of this diatomite powder—because of its great bulk per unit weight, and the irregular shape of the individual particles—fluffs up the final dust. This helps neutralize the effect of heavy extenders—insuring better dispersion of the poison.

Celite is also an excellent absorption medium for liquid poisons. Its exceptionally high absorption capacity permits a much higher percentage of liquid poison to be absorbed while still maintaining a dry dust concentrate. This results in a more potent effect in the final product . . . as well as in lower packaging and shipping costs.

Why not investigate the use of Celite as a means of improving your product and making your operation more profitable? For further details, write Johns-Manville, Box 60, N. Y. 16, N. Y.

Properties of CELITE

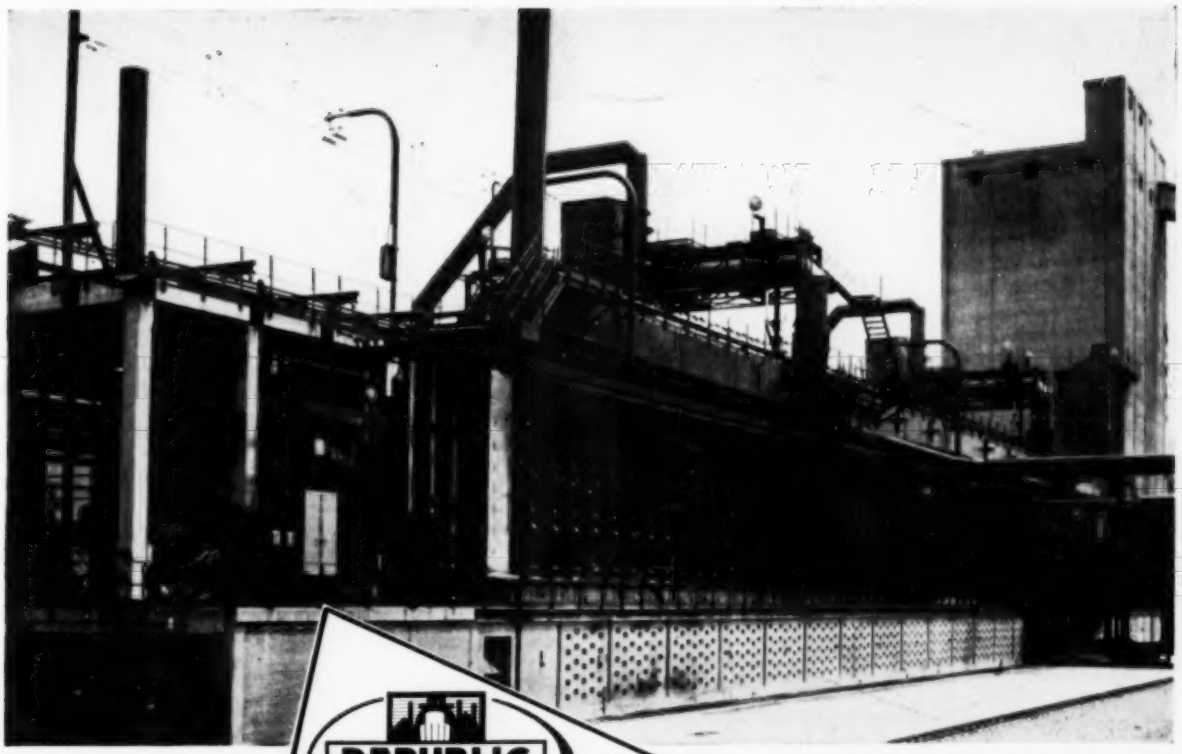
FINENESS: Approximately 100% through 325 mesh
DENSITY (Vibrated): 11 pounds per cubic foot
BULK: Celite bulks much higher than most diluents
ABSORPTION: 200% of its weight of water
300% of its weight of kerosene
pH VALUE: Below 7.0
INERTNESS: Compatible with insecticide and fungicide poisons
SUSPENSION: Excellent in both air and water
COMPOSITION: Celite is amorphous diatomaceous silica (SiO_2)

Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

Johns-Manville CELITE

JOHNS MANVILLE JM PRODUCTS

DILUENTS AND GRINDING AIDS



More than $450,000,000 has been invested by Republic Steel in new steel-making plants and equipment, including modern coke ovens and coal chemical plants such as this.

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Republic Steel's expansion program provides even more top-analysis AMMONIUM SULPHATE

Additional blast furnace capacity at Republic Steel required the construction of new, modern coke ovens. And added coke-oven capacity means that you now can get even more top-quality Ammonium Sulphate from Republic.

This high-capacity source of Ammonium Sulphate for your blends and mixes of nitrogenous fertilizers is ready to ship promptly and at regular intervals to meet your needs. For information on Republic Ammonium Sulphate, contact or write to:

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AMMONIUM SULPHATE

INDUSTRY *News*

Dr. Parrott Dies in N. Y.

Dr. Percival J. Parrott, 79, former director of the New York State Agricultural Experiment Station at Geneva, died August 10. He had headed the Station from 1938 to 1942 at which time he retired.

His lifetime of work in entomology took him to many parts of the world for the U. S. Department of Agriculture seeking means of controlling Mediterranean fruit fly in the Florida peninsula. He was made assistant entomologist at the N. Y. station in 1900, but left two years later to become entomologist at the Ohio State Agricultural Experiment Station at Wooster. He returned to Geneva in 1903 and remained until his retirement.

•

Ethyl Corp. Ups Krieger

The appointment of C. George Krieger as manager of agricultural chemical sales has been announced by M. P. Murdock, vice-president in charge of sales for Ethyl Corporation, New York. Mr. Krieger, regarded as an outstanding agricultural expert, joined the company in 1929 as an agricultural engineer. In 1932 he was named director of tractor activities in the technical sales department, and shortly thereafter pioneered the development of the modern high-compression tractor. He was appointed head of the company's agricultural division in 1942.

From November, 1942, through 1944, he served on the War Production Board, first as director of the farm machinery and equipment division, and later as special assistant to chairman Donald Nelson. Upon his

C. GEORGE KRIEGER

return to Ethyl, he was named assistant to the general sales manager, in charge of rural marketing and special development work.

Ethyl's agricultural chemical sales are handled as an activity of the chemical sales division, of which Harry Kuhe is manager.

•

New Division Plant Manager

Elliott M. Harold has been appointed branch plant manager of the New Orleans mixed fertilizer plant of The Davison Chemical Corporation to succeed Henry Gaudet, who is retiring as manager but continuing as a consultant, W. N. Watmough, Jr., vice-president, announces. The plant and offices are located in Gretna, La.

Calspray Gets Mid-State Co.

California Spray-Chemical Corporation, Richmond, Calif. has acquired assets of the Mid-State Chemical Supply Co., the corporation has announced. The move will enable Calspray to offer its growers and dealers more efficient service, better deliveries, and the benefits of stepped-up research, according to a company spokesman.

George Wood, Calspray manager at Frenso, Calif., points out that handling of the fertilizer line formerly sold by Mid-State will be a new venture for Calspray. He indicated that the corporation will probably continue to expand the fertilizer business which was initiated and conducted by Mid-State. This phase of the operations will be headed by Les R. Hamilton.

It was indicated also that Mid-State personnel will be retained by Calspray, although there may be some adjustments in supervisory capacities over production and sales. New branch manager at the former Lindsay office of Mid-State, will be Clifford Gay and Louis Grabe will be new branch manager at Bakersfield.

The parent firm plans to step up its consumer services in pesticides, fungicides and weed killers. Since World War II, Calspray has established 34 new plants in twenty states, territories and countries; made available to farmers some 300 new products and increased its number of employees by 100%. The acquisition of Mid-State Chemical Supply Co. is another step in the expansion program.

Forms Empire Chem. Co.

C. F. LUNSFORD

C. F. Lunsford has established the Empire Chemical & Supply Co. in San Francisco. The new firm will process and sell pesticides both in the domestic and export markets. Mr. Lunsford has been in the agricultural chemical field for some twenty-five years.

•

Chipman Names New Officers

Chipman Chemical Co., Bound Brook, N.J., has named Warren H. Moyer president, to succeed O. M. Bernuth, who resigned to become chairman of the board of directors.

Other changes in the status of company executives include the advancement of Byron T. Webster to vice-president; Charles M. Bernuth, treasurer; Cornelius A. McAloon, secretary, and Charles P. Inman, assistant secretary.

The company, well known in the agricultural chemical field, manufactures a broad line of agricultural insecticides, fungicides, weed killers and seed disinfectants. Executive offices and factory are located at Bound Brook, but the company maintains branch offices and factories at Chicago, Ill.; North Kansas City, Mo.; Palo Alto, California; Pasadena, Texas; Portland, Oregon; and St. Paul, Minn. An affiliate company, Chipman Chemicals, Limited, is located in Canada, at Winnipeg, Manitoba.

Subsequently, the company has announced two additional members to its board of directors. They include E. P. Bernuth and I. W. Bales. Mr. Bernuth is vice-president of Bernuth Lembcke Co., New York and Mr. Bales is director of research and technical service for Chipman.

•

New P. C. Borax Co. Plant

The Pacific Coast Borax Company's Agricultural Sales Division has just completed its new plant for the mixing of agricultural chemicals at Slaton, Texas. Initially herbicides and cotton defoliants will be produced in this plant, the company states.

J. M. Nunn, formerly head of the Dumas Farm & Ranch Supply Company at Dumas, Texas, is in charge of operations with headquarters at Lubbock, Texas, according to F. T. Winters, Jr., manager, Agricultural Sales Division.

•

Devenco Retains Riedeburg

Devenco, Incorporated, 150 Broadway, New York, has retained Riedeburg Associates as chemical and technical consultants in connection with formulations, marketing and sales development of the company's product, "Swingfog". The machine is a fog-maker designed to apply various pesticides on agricultural crops. It operates on the pulse-jet principle and is light enough that it may be carried easily by the operator.

•

Va. Pasture Tour Sept. 9-11

A pasture tour sponsored jointly by the Forage and Pasture Crops Committee of the National Fertilizer Association and the Virginia Polytechnic Institute, was scheduled for September 9-11, according to Dr. Borden S. Chronister, Nitrogen Division, Allied Chemical & Dye Corp., Hopewell, Va., chairman of the NFA committee.

The tour was to begin at Roanoke, Va., on September 9 and proceed from there to dairy and livestock farms in the vicinity. The group was to spend that night at Charlottesville, Va. spending part of the next morning at the Piedmont Research Station at Orange, Va. Here pasture experiments have been made on one of the state's least fertile soils (Nason-Tatum soil) and the role of fertilizer in increasing yield was to be studied.

A banquet was scheduled to be held at the George Washington Hotel, Winchester, Va. Thursday evening, and the next morning the group was to visit the Northern Virginia Pasture Research Station at Middleburg, Va. Here, Drs. R. E. Blaser and W. L. Griffith were to conduct the men on a tour to inspect the grazing and small plot experiments on the station grounds. Such experiments have been under way since 1949.

Purpose of the tour was to give members of the fertilizer industry and others interested in soil fertility, including members of college and extension staffs, an opportunity to study and evaluate the progress made by Virginia farmers in developing and utilizing pastures on livestock and dairy farms.

Smith-Douglass Employees Retired Under New Plan

Ralph B. Douglas (fourth from right), president, Smith-Douglass Co., Norfolk, Va., congratulates the first employees of the company to participate in the employees' retirement plan established ten years ago. The ceremonies held recently in connection with the retirements, included a barbecue and watermelon feast and a talk by Mr. Douglas who reviewed the company's progress during the past year.

The seven employees being honored were the first to become eligible for retirement on the basis of age, Mr. Douglas said. Their employment at S-D ranged from 16 to 30 years.

In addition to those being retired from the S-D Norfolk plant, the following have been pensioned from other plants: F. C. Wozniak, Lynn, Mass.; A. V. Kansky, J. H. Koch, P. O. Massey, Joseph Sladky, Sr., and Esau Funches, all of Granite City, Ill.

To New Post at Dow

Glenn Gullikson, formerly with The Dow Chemical Company's Minneapolis office, has been named supervisor of a newly created product education and merchandising section of the Agricultural Chemicals Sales Department, it is announced by W. W. Allen, department manager.

The new section will provide the department with specialized services, made necessary by the increased growth of the company's over-all line of agricultural chemicals, Mr. Allen said. Don O. Sanford, who has supervised merchandising work as part of his duties in the past, will now devote his entire time to activities as product manager of insecticides and fungicides.

•

Cotton Defoliation Urged

That cotton defoliation will be particularly valuable this season, is the advice of the National Cotton Council, Memphis, Tenn., in a statement to growers made recently. Both areas where too much rain has fallen and other regions suffering from drought may benefit from this practice, the Council says.

"In the Southeast, where rainfall has been above normal, much cotton has grown tall and rank. Here, defoliation may prove worth-while if used only to prevent boll rot", it says.

On the other hand, late cotton is indicated for much of the mid-south where rainy weather delayed planting, then a long dry period slowed germination of seed after it was planted. Defoliation after the cotton is mature will help by speeding up the harvest and allowing growers to get the crop out of the field before adverse weather damages the quality of fiber and seed.

It is pointed out further, that many producers face a special problem in defoliating this year. On the same farm, cotton in one field may be far ahead of cotton in an adjacent field. "This means the two fields will not be ready for defoliation at the same time. Application of defoliants on the young cotton should be delayed until it is mature. Defoliation of immature cotton will result in reduced yields and lowered quality of seed and fiber.

"No matter where cotton is grown, defoliation is almost a "must" if mechanical harvesting is to be used. Unless leaves are removed from the plant, they tend to clog the spindles of mechanical pickers and add trash to seed cotton that is being stripped. Defoliation helps eliminate this problem, and also the problem of green leaf stain," the Council concludes.

Shell Chemical Names Stayner and Lawler

JAMES J. LAWLER

LAWRENCE F. STAYNER

FRED W. Hatch, manager of the Julius Hyman & Company Division of Shell Chemical Corporation, has announced two high level changes in his sales staff. Lawrence F. Stayner, formerly sales manager of the division, has been made assistant to the manager and in that position will work directly with Mr. Hatch on general division problems. James J. Lawler will become sales manager after a brief special assignment in Shell Chemical's headquarters in New York. The Hyman Division headquarters are in Denver, Colorado.

Mr. Stayner started his career with Shell as an agricultural salesman in 1938 in Los Angeles. Previously, he had spent several years with Balfour, Guthrie & Company. Rising through a series of positions of increasing responsibility in agricultural marketing in San Francisco and New York, he transferred to Shell Chemical in 1949 and became sales manager of the Julius Hyman & Company Division when Shell bought it in 1952.

Mr. Lawler joined Shell as a salesman in St. Louis in 1937 after receiving degrees in chemical engineering and organic chemistry from University of Missouri, serving in both technical and sales capacities in the St. Louis area. He transferred to Shell Chemical shortly after his return from a four-year military leave and has been manager of that company's St. Louis and Chicago sales districts.

•

Spencer Appoints Dr. Brown

Dr. John R. Brown, Jr., has been named general manager of Research and Development of Spencer Chemical Company in Kansas City, Mo. He succeds R. F. Brown, now Spencer general works manager. Dr. Brown had been vice-president and director of research of the Lambert Pharmacal Company in St. Louis.

A graduate of Oberlin college, Ohio, Dr. Brown received an M. A. Degree in Chemistry in 1935. He took additional graduate work at the Massachusetts Institute of Technology, receiving an Sc. D. Degree in Chemical Engineering in 1938. He specialized in colloid chemistry.

In 1938 Dr. Brown went to work for Esso Laboratories, chemical division of the Standard Oil Development Company in Elizabeth, N. J., and served as assistant director of the Chemical Division from 1941 to 1946.

One-Stop NITROGEN Service For Fertilizer Manufacturers

LION

Nitrogen

FERTILIZER MATERIALS

LION ANHYDROUS AMMONIA—For formulation. A uniformly high-quality basic product. Nitrogen content, 82.25%.

LION AQUA AMMONIA—For formulation or acid oxidation. Ammonia content about 30%. Other grades to suit you.

LION AMMONIUM NITRATE FERTILIZER—For direct application or formulation. Improved spherical pellets. Guaranteed 33.5% nitrogen.

LION NITROGEN FERTILIZER SOLUTIONS—For formulation. Three types to suit varying weather and manufacturing conditions.

LION SULPHATE OF AMMONIA—For direct application or formulation. Large free-flowing crystals. Guaranteed nitrogen content, 21%.

TECHNICAL SERVICE—Lion provides special technical assistance for fertilizer manufacturers. Write to CHEMICAL SALES DIVISION for quick service.

LION OIL COMPANY

EL DORADO, ARKANSAS

Dow Names Norton & Lynn to New Posts

DR. T. R. NORTON

G. E. LYNN

G. E. Lynn has been named as administrative assistant in Agricultural Chemical Research for The Dow Chemical Company, Midland, Mich. and Dr. T. R. Norton has assumed new duties as director of the Agricultural Chemical Laboratory in Dow's Midland Division according to Dr. J. E. Johnson, director of Agricultural Chemical Research.

Mr. Lynn, a Dow employee since 1935, has been in charge of research on insecticides, fungicides and weed killers since 1937, and served for several years as assistant director of the Biochemical Research Department.

In his new position he has taken on administrative responsibilities involving the over-all operation of the company's agricultural chemical research, including work at Midland and South Haven, Michigan, Seal Beach, Fresno and Sacramento, California, Lake Jackson, Texas, and Greenville, Mississippi. He is a native of Rantoul, Illinois, and holds a degree in chemistry from the University of Illinois.

Dr. Norton, a native of California, joined Dow's Western Division in 1945. Before transferring to Midland he was supervisor of the organic section of the company's laboratory at Pittsburg, California.

His new duties include the technical and improved agricultural chemicals. He is supervising the testing of new compounds and working closely with other Dow laboratories compounding chemicals of potential value in modern agriculture.

Dr. Norton attended the College of the Pacific and completed his Ph.D. degree at Northwestern University.

•

To Florida for Diamond

Diamond Alkali Company has announced the appointment of Charles P. Egolf III as sales and service representative for the state of Florida, to succeed Frank V. Allen. Mr. Egolf, whose home is in Lakeland, will handle the complete line of Diamond's chemical products. For the past year he has been employed as a research chemist by the Food Machinery & Chemical Corp. at Lakeland and before that time, was a research chemist with the International Minerals & Chemical Corp. at Mulberry.

A native of Pennsylvania, Mr. Egolf attended a Philadelphia high school, and immediately after graduation was called to active duty with the U. S. Marine Corps as a private. After six years of service, three of it in the Pacific Theater, he was discharged with the rank of captain.

Mr. Egolf then enrolled at West Virginia Wesleyan College, Buckhannon, W. Va., and in 1951 was graduated cum laude with a B. S. degree in chemistry and then took courses in the Graduate School of Chemistry at Florida State University, Tallahassee.

•

To Enter Ammonia Field Soon

Columbia-Southern Chemical Corp., wholly-owned subsidiary of Pittsburgh Plate Glass Co., will enter the ammonia production field soon. According to E. T. Asplundh, president, plans are made for construction of the firm's first ammonia producing facility at Natrium, W. Va. Contracts for the construction work will be let soon and production is expected to be under way late in 1954.

The corporation plans to utilize by-product hydrogen from electrolytic production of chlorine and caustic soda in the ammonia production. Its present plant at Natrium has burned the existing hydrogen supply as fuel in the past.

In discussing its decision to start production of ammonia, Columbia-Southern points out that although the chemical industry has been increasing its production facilities constantly, the product has been in short supply since World War II. Ammonia is finding increased utilization as a base chemical particularly in fertilizers and cattle feed as well as industrially.

Natrium, W. Va. was chosen as the site for the new ammonia facilities because of the availability of hydrogen supply and because industrial and agricultural outlets can be serviced readily from the location. Columbia-Southern has other basic chemical producing plants at Barberton, Ohio; Corpus Cristi, Texas; Lake Charles, La.; and Bartlett, Calif., in addition to its operations at Natrium.

•

Bradley to Executive Post

Bradley Pulverizer Company, Boston, Massachusetts, has announced the appointment of Peter B. Bradley as general manager of its Allentown, Pennsylvania, plant. The announcement was dated August 6.

Mr. Bradley has been chosen to succeed the late William A. Gibson who had held the post up to the time of his recent death.

HERE'S THE ANSWER TO YOUR SPREADING PROBLEMS!

AGAIN! "The NEW LEADER" leads the field

Commercial Fertilizer Attachment Hood—Two Sizes: 19-foot or 23-foot

with its new "Motor-Driven Spreader" offering greater accuracy of spread with the most positive feed on the market!

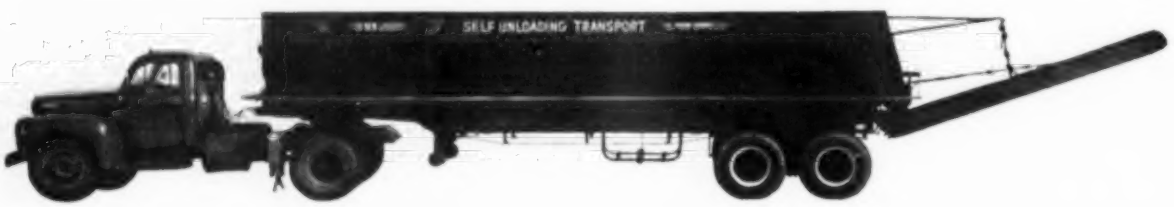
SPECIAL ADVANTAGES — Uniformity of spread is not dependent on truck speed. Motor is mounted on catwalk and drives only the twin distributor discs at a constant speed, assuring full width of spread at all times together with uniform distribution.

Conveyor is separately driven from truck drive shaft by a series of V-belts to deliver the correct amount per acre—regardless of truck speed or regardless of whether the truck is driven in low, super-low or any other gear.

Conveyor speed is, therefore, positively synchronized with speed of the rear wheels of the truck and at each revolution of the rear wheels, the conveyor moves a given distance regardless of the truck's speed. Amount of material delivered by conveyor does not vary with hilly or soft field conditions.

Spreader Body Lengths (inside measure) are 9′, 11′, 13′ and 15′. Other body lengths on special order.

Note: When Spreading Attachment is folded up for road-traveling position, width is approximately 7′-5″.



"The NEW LEADER" Self Unloading Bulk Transport

The 20-ton capacity transport above is shown with elevator in place and ready to load a NEW LEADER Spreader truck. These units are proving very profitable; in bad weather they eliminate demurrage on railroad cars; fertilizer gets to the job quickly and spreader trucks can be kept working in the field. The transport, being a self-unloading unit, leaves the tractor truck free to return to pick up another transport load. These units have four individual compartments of 5 tons each. Each compartment may be unloaded independently of the others. Compartments and rear endgate are removable so that bagged and packaged goods may be hauled instead of bulk loads. Capacity 5 tons to 25 tons, lengths from 11 ft. to 40 ft. Written warranty with all NEW LEADER equipment. Write today for specifications, prices, etc. Fast delivery service sells fertilizer!

FREE! Write for "The Story of a Custom Fertilizer Spreading Service"

HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

Washington's Shoreham Hotel Host as four organizations of

Control Officials Meet

CONTROL officials from every state are expected to converge on Washington, D.C., in October as their four Associations meet in annual conventions from October 12 to 17. All sessions are scheduled to be held at the Shoreham Hotel. The Association of Official Agricultural Chemists will convene on October 12, continuing through the 14th; the Association of American Feed Control Officials, October 14 and 15; the Association of American Fertilizer Officials, October 16 and the Association of Economic Poisons Control Officials, Saturday, October 17.

William Horwitz, Food and Drug Administration, Washington, D.C., secretary-treasurer of the A.O.A.C., indicated that while the program was not complete at press time, the group would hold sessions on foods, feeding stuffs, soils (including possible discussions of methods of analysis and evaluation of soil conditioners), disinfectants and economic poisons, fertilizers, drugs, cosmetics and vitamins. The referee on extraneous materials in foods was to arrange a special program on methods and techniques as part of the meeting.

Dr. Leslie E. Bopst, University of Maryland, College Park, Md., executive secretary of the Association of American Feed Control Officials, stated in August that the group's program would not be prepared until sometime in September . . . too late for publication.

Fertilizer Officials Set

OPENING with an address by president Parks A. Yeats, Oklahoma City, Okla., the Fertilizer Officials will have a full day of activity on Friday, October 16.

Well-known names appear on the agenda for the morning session. These include Dr. Russell Coleman, president, The National Fertilizer Association, Washington, D.C.; Paul T. Truitt, president, American Plant Food Council, Inc., Washington; and E. A. Epps, Louisiana State Chemist, Baton Rouge; in addition to Dr. Yeats.

Aaron Baxter, Coke Oven Ammonia Research Bureau, Inc., will speak on "Evaluation of Secondary Elements in Fertilizer"; Dr. Vincent Sauchelli, Davison Chemical Corp., Baltimore, Md., on "Present Status of Surface Wetting Agents for Fertilizer Use"; and "Progress in Fertilizer Granulation" will be presented by I. O. Hardesty and R. M. Magness.

Foliar application of plant nutrients will be the subject of a paper presented by Dr. Jackson B. Hester, Campbell Soup Co.

Reports of investigators will be made by the following control officials: M. H. Snyder, Charleston, W.Va.; M. P. Etheredge, State College, Miss.; J. W. Kuzmeski, Amherst, Mass.; J. F. Fudge, College Station, Texas; R. W. Ludwick, State College, N.M.; W. B. Griem, Madison, Wis.; J. B. Smith, Kingston, R.I.; R. C. Berry, Richmond, Va.; Gordon Hart, Tallahassee, Fla.; E. W. Constable, Raleigh, N.C.; John L. Managhan, Topeka, Kans.; Parks A. Yeats, Oklahoma City, Okla.; F. W. Quackenbush, Lafayette, Ind.; A. H. Harris, Raleigh, N.C.; A. B. Lemmon, Sacramento, Cal.; E. A. Epps, Jr., Baton Rouge, La.; and M. B. Rowe, Richmond, Va.

The last meeting of the week, Saturday, October 17, will be held by the Association of Economic Poison Control Officials, Inc. According to Dr. Albert B. Heagy, University of Maryland, secretary-treasurer of the A.E.P.C.O., the program will include an address by president Rodney C. Berry, Virginia State Chemist, Richmond; another address by Dr. K. Starr Chester, supervisor, Battelle Memorial Institute, Columbus, Ohio; and a talk by Van Miller, vice-president of the National Better Business Bureau, Inc., Washington, D.C.

Dr. Heagy stated in August that the program is expected also to include a representative of either the National Agricultural Chemicals Association or the Western Agricultural Chemical Association.

Committee reports will occupy the remainder of the morning's program and are expected to continue into the afternoon session. Dr. Heagy indicates that the afternoon program following the completion of the committee reports will be a closed session.

Imports of Potash from Red Sources "Unnecessary", House Sub-Committee Declares

PRODUCTION of potash in the United States, plus anticipated imports from free countries, is adequate to meet all foreseeable American needs for this material including its use as a fertilizer element", is the conclusion reached by the House Subcommittee on Fertilizer and Farm Machinery on July 30.

The conclusions were decided upon from testimony presented at hearings on April 20 and June 8 by representatives of the potash and fertilizer industries and spokesmen for the U. S. Departments of State, Agriculture and Commerce.

In view of the plentiful supply of potash, the committee went on to conclude: "There is no need for potash to be imported into the United States from behind the Iron Curtain, for now or in the forseeable future. Although the quantity of potash imported from Iron Curtain sources has not until this time been a serious threat to the American potash industry, it is clearly sufficient to seriously disturb and unsettle the marketing of domestic potash in the eastern part of the United States and if continued it could become a serious threat to the American potash industry.

"Whatever the position of the State Department may be with respect to trade in general with countries behind the Iron Curtain, this subcommittee believes that importation of potash produced in Russian-dominated countries is not necessary, cannot possibly benefit the economy of the United States and should be discontinued."

From facts developed at the hearings, the Subcommittee established that importations of potash from behind the Iron Curtain began to rise sharply in 1950, with a total of 65,000 tons that year as compared to less than a thousand during 1949.

Strikes in the New Mexico mines were found to involve the Mine, Mill and Smelter Workers' Union, later expelled from the CIO when found to be Communist-dominated. Evidence was found to indicate that the M.M.S.W.U.'s policies were dictated and dominated by the Communist Party.

Red-produced potash importations totaled 95,000 tons in 1951 and 55,000 tons in 1952. When the material was badly needed in the U. S. during the strike, Red potash was sold in the U. S. at about $50 per ton, as compared to the established U. S. price of around $37 a ton. Later, when domestic supplies of potash became ample, East German Potash was offered along the Atlantic seaboard for prices sometimes below $30 per ton.

That supplies are ample in the U. S., was brought out in testimony from a U.S.D.A. representative who declared that the production goal for the domestic industry set by the Defense Production Administration would soon be reached. This goal calls for a domestic capacity of about 2 million tons annually by July 1, 1954. With imports of about 200,000 tons a year, achievement of the expansion goal may be expected to provide potash supplies fully adequate to satisfy agricultural requirements, it was pointed out.

Chairman of the Subcommittee is Charles B. Hoeven, (Ia.). Members are: Ralph Harvey, (Indiana); Page Belcher, (Oklahoma); Clifford G. McIntire, (Maine); William C. Wampler, (Virginia); E. C. Gathings, (Arkansas); Thomas G. Abernethy, (Mississippi); Carl Albert, (Oklahoma); and James G. Polk, (Ohio).

•

OIT Eases Fertilizer Exports

A wide group of chemical fertilizers were included in the relaxation of export controls announced by the Office of International Trade on August 6. The action left only three fertilizers under license; urea, ammonium nitrate and ammonium sulfate. Removed from licensing were ammonium phosphates, (Schedule "B", Nos. 838,500 and 854,100), nitrogenous chemical materials not elsewhere classified in schedule "B"; normal phosphate; superphosphate; concentrated superphosphate; potassium chloride and potassium sulfate; nitrogenous phosphatic types of fertilizer not elsewhere classified in Schedule "B" ("B" No. 854,900) and prepared fertilizer mixtures. ("B", No. 855,100).

Individual export licenses will be required for these latter items only for shipments to Hong Kong, Macao and Iron Curtain countries. Shipments to other parts of the world may be made under "general license GRO" without prior application to OIT.

Observers in the trade indicate that this action on the part of OIT indicates ample supply of fertilizers in the U. S. Export demand has been low for some months, due both to lack of dollars on the part of buyers abroad and also from stepped-up production in Europe.

•

Shellmar Betner Div. Formed

Continental Can Company's two recent acquisitions, the Benjamin C. Betner Company and Shellmar Products Corp., have been consolidated into the new "Shellmar Betner Flexible Packaging Division."

In charge of the operations for the new division is Benjamin C. Betner, Jr. who makes his headquarters in Mt. Vernon, Ohio, formerly the main office of Shellmar.

Shellmar Betner Flexible Packaging Division plants are located in Mt. Vernon and Zanesville, Ohio; Appleton, Wisconsin; Devon, Pa.; Richmond, Va.; Columbus, Ga.; Beaumont and Paris, Texas; and Los Angeles and South Gate, California.

Entire Industry Invited to

Fertilizer Safety Conference

THAT Ralph J. Crosby, Marsh & McLennan, Inc., New York, will be one of the speakers on its October 22 program, has been announced by the Fertilizer Section of the National Safety Council. Mr. Crosby is widely known in safety circles. The section's third annual meeting, scheduled to be held at the Hamilton Hotel, Chicago, will include not only a speaking program, but also a demonstration on the use of carbon dioxide in reducing hardened piles of fertilizer in storage.

This demonstration, sponsored by the Cardox Corp., Chicago, will be held at the Chicago Heights plant of International Minerals & Chemical Corp. Special buses will be used to transport the group to and from Chicago Heights.

According to information from J. Lauren Shopen, chairman of public relations for the Section, other speakers appearing on the program will include John E. Smith, Spencer Chemical Co., Kansas City, Mo., general chairman of the fertilizer safety section, who will present his annual report of progress. Dr. Neal Bowman, National Association of Manufacturers, noted lecturer and sales psychologist, will address the fertilizer group. His address is expected to bring out practical information based on his varied career as a shipping foreman, retail store manager, trade paper editor and a director of advertising and publicity.

Another prominent speaker, Dr. Stewart L. Rankin, will discuss "Safety—A Way of Life" and open

RALPH J. CROSBY

discussion periods will be provided to cover case histories, investigations and measures to reduce the number and severity of accidents.

Curtis A. Cox, Virginia-Carolina Chemical Corp., Richmond, Va., will describe CO_2 blasting technique preceding Thursday morning's demonstration.

The program committee, headed by John E. Smith and comprised of Vernon S. Gornto, Smith-Douglass Co., Norfolk, Va. and Thomas J. Clarke, GLF, Ithaca, N. Y., expects to present a schedule of events useful to all members of the fertilizer manufacturing trade.

In all, six speakers will relate in detail, circumstances surrounding recent accidents in their plants. The talks will include information regarding the nature of the accident, its severity and its cost. In addition, each speaker will describe the subsequent investigation, pointing out by whom the investigation was made, what it disclosed, and steps taken to avoid repetition.

A question-and-answer session will enable those in the audience to ask speakers for further details or clarification of any point. The crowd will also be given an opportunity to tell about how similar accidents in fertilizer plants have been controlled.

The original six case histories will cover different types of accidents and are expected to help in the overall reduction of mishaps in the fertilizer industry.

Outstanding speakers to appear on program: Fertilizer industry expected to turn out in large number at Chicago meeting. Use of carbon dioxide for reducing hardened piles of fertilizer to be demonstrated at plant.

News BREVITIES

BETWEEN 20,000 AND 25,000 acres in Las Animas county, Colo. were being sprayed with aldrin and diesel oil in an attempt to control a serious infestation of grasshoppers last month. Ground applicators rather than airplanes were being used, the report indicated. The Federal Government furnished the toxicant while ranchers and county and state highway departments provided the machinery and labor. The aldrin was being used at the rate of three ounces per gallon of Diesel oil, with excellent results.

•

RALPH C. PHILLIPS has joined the Chemical Research and Engineering Division of Mathieson Chemical Corporation in Baltimore as a staff engineer. He will serve as a special assistant to the division's president, Dr. C. F. Prutton, on work being carried out by Mathieson for the United States Government.

•

HEADQUARTERS OF THE EASTERN Seaboard Supply Corp., distributors of agricultural and industrial chemicals, have moved to 145, South Franklin Ave., Valley Stream, Long Island, New York, the firm has announced.

•

THURSTON CHEMICAL CO., Joplin, Mo., has appointed Leon Holliday as accounts supervisor, according to Wm. R. Thurston, president. Mr. Holliday will coordinate credit, sales and all functions pertaining to accounts receivable.

•

ADDITIONAL PERSONNEL APPOINTMENTS for American Cyanamid's new nitrogen chemicals plant under construction near New Orleans, La., have been announced recently. They include the following:

J. J. Fitzgerald as assistant to the plant manager, R. T. Lukat, ammonia department superintendent; H. E. Graulich, production supervisor; L. J. Cormack, mechanical department superintendent; H. T. Walker, assistant employee relations director and E. J. Palisin, industrial engineer. Manager of the plant is G. J. Forney.

•

GILMAN PAPER COMPANY, New York, has announced the appointment of Fletcher L. Munger as western sales manager in charge of the company's Chicago office. Mr. Munger succeeds E. A. Kendler whose retirement has just been announced. He will be responsible to Harry C. Lawless, vice-president and director of sales for Gilman, on sales of all products of Gilman Paper Company and its subsidiary — Kraft Bag Corporation.

•

O. R. BAILEY has been named chief construction engineer of Monsanto Chemical Company's Phosphate Division, the company has announced. Mr. Bailey, was formerly maintenance superintendent at the plant at Monsanto, Tenn.

Ralph Neubert, who since 1950 has been maintenance superintendent at Monsanto's Anniston plant, has been named to succeed Mr. Bailey at the Tennessee plant.

•

CHILEAN NITRATE SALES CORPORATION, New York, has announced the appointment of Harold E. Hamby as district manager of the company's Shreveport, La., office to succeed the late Frank R. Curtis. Mr. Hamby, for a number of years, has been a member of the firm's sales organization in Georgia.

•

A 350-ACRE FARM NEAR SHAWAN, MD. has been selected as the site for the Mathieson-Squibb Institute of Chemical Research and Engineering, it has been announced. Plans include experimental work with the company's varied agricultural products such as plant foods, insecticides and animal nutritional supplements. About two years will be required to adapt the farm to its new uses, it is estimated. The Squibb Institute for Medical Research will remain in its present quarters at New Brunswick, N. J.

•

PHILLIPS CHEMICALS CO., subsidiary of Phillips Petroleum Co., has moved its fertilizer sales office in Houston to a new location at 1020 East Holcombe Boulevard from its former location in a downtown building. R. D. Evans will continue to be manager of the Houston fertilizer sales district, the company states.

•

W. F. MULVANEY, SALES MANAGER of Bemis Bro. Bag Company's multiwall paper bag plant at Peoria, has been appointed supervisor of multiwall paper bag sales for the entire Bemis company. He succeeds C. W. Akin, who has been made assistant director of sales for Bemis. R. L. Baker, Jr., formerly assistant sales manager, succeeds Mr. Mulvaney as sales manager at Peoria.

The appointment of K. W. Koechig as supervisor of small paper bag sales for Bemis has also been announced. He previously was assistant to Mr. Akin.

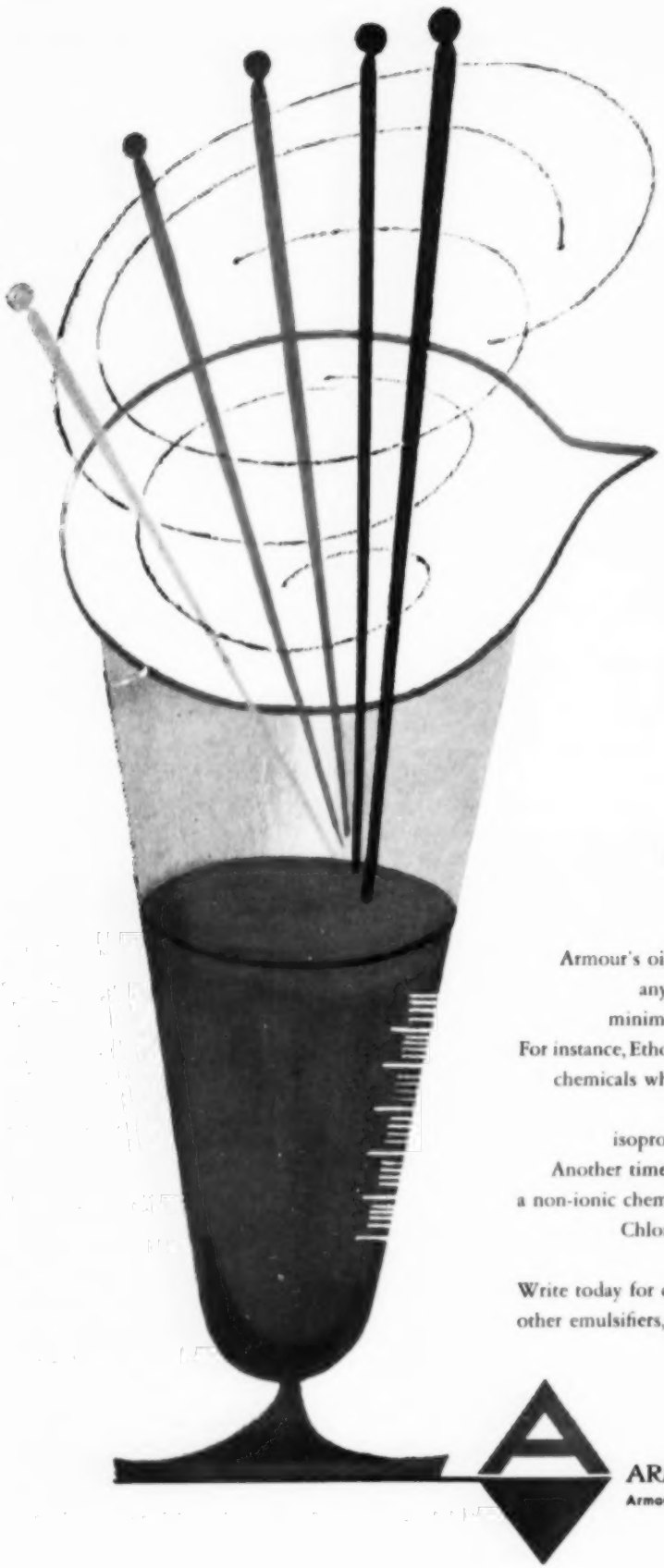
•

THE FIRST OF SEPTEMBER was expected to mark the completion of a new addition to the Chatham, Ontario, plant of Canada Packers, Ltd. The addition increases total floor space of the plant by about 10,000 square feet, it is reported.

•

GROUND HAS BEEN BROKEN for the new $275,000 Barteldes Seed Co. office and warehouse in Denver, Colo. When completed, the unit will be the largest of its type in the Rocky Mountain area, according to the company. To be known as the "Barteldes Garden Center," it will house a retail self-serve store, wholesale department, nursery seedpackaging room, bulk seed room and warehouse. Completion is scheduled for the first of the year. The firm handles not only seeds, but fertilizers and insecticides as well.

Fertilizer Manufacturers are urged to fill out and return safety questionnaires being sent out by the Fertilizer Section of the NSC. The answers are needed for basic statistical information!



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Oregon Firm Names Manager

Rob't. Seufert "Al" Fitzpatrick

White Star Concentrates Co., Portland, Oregon, has announced the appointment of G. A. "Al" Fitzpatrick to be in charge of the new fertilizer and chemical departments of the company. Mr. Fitzpatrick was formerly manager of the chemical division of Pacific Supply Co-op, Portland, Oregon.

Mr. Fitzpatrick obtained his early education at Idaho Falls, Idaho, and graduated from the University of Idaho in 1935. Following his schooling, he became associated with the firm of F. H. Woodruff and Sons, and worked in Wyoming and Montana. He advanced with this company and eventually was selected Northwest manager with headquarters at Tekoa, Wash., in 1947.

That same year he accepted a position with Pacific Supply Co-op in the chemical division and assumed the managership of that department in 1948, where he remained until July 1 of this year. Mr. Fitzpatrick is married and has two sons.

Robert Seufert is owner of White Star Concentrates Co.

•

Pioneer Markets "Alphenol"

Pioneer Chemical Associates, Denver, Colo., is arranging for the marketing this season of "Alphenol Cotton Defoliant", "Alphenol Soybean Defoliant" and "Alphenol Potato-Vine Killer." According to J. Newton Hall, head of P.C.A., both marketing and manufacturing arrangements are being made under agreement with Great Lakes Solvents, Inc., developers of the trade-marked products under the name of "Alphenol."

A description of the product, as given by Pioneer, follows:

"'Alphenol is the coined name for a mixture of the alkyl phenols supplemented with pentachlorophenol, arranged in concentrations and in a manner which either effects a degree of synergistic action or gives the phenolic components optimum activity in attacking plant fibres and destroying the plant life processes.

"The product has been developed by Great Lakes Solvents, Inc., in collaboration with Government and University authorities for the specific function of effecting rapid reduction of plant foliage through fibre destruction and attack on plant cell processes.

"'Alphenol' is being made commercially available by manufacturers and processors of agricultural chemicals in two forms, an oil soluble concentrate containing 90% 'Alphenol' and a 45% concentrate for dilution with water and oil or with water alone. Other commercial uses of 'Alphenol' are indicated."

•

Errors Noted in Articles

A typographical error in table 1 of J. N. Lowe's article on Phosphatic Feed Supplements in our August issue gave the 1952 consumption as 53,000 tons. Obviously, the total should have been 530,000. We regret this error and trust that readers will have recognized it as such in studying the table. It appeared on page 45 of last month's issue.

The same Gremlins responsible for the typographical error in our August issue must also have been on hand when the July magazine went to press. Our attention has been called to a proof-reading mistake in the article on Cotton Defoliation by A. G. Ash and E. H. Karr. On page 109, we reported that "Use of the material on well over 150 acres in 1952 confirmed the results of the 1951 tests."

This comprises the under statement of the month in saying "Well over 150 acres . . .", for the figure should have 150,000 acres!

Joins Thurston Chemical Co.

H. G. "GAY" BARCLAY

Thurston Chemical Co., Joplin, Mo., has announced the addition of H. G. "Gay" Barclay to its staff. Mr. Barclay has had broad experience in the fertilizer and insecticide fields, having been associated previously with W. R. Grace & Co.; Naco Fertilizer Co., Wilmington, N. C.; and later with Naco in Charleston, S. C. His latest position was that of manager of the Naco Farm Supply in Vero Beach, Florida.

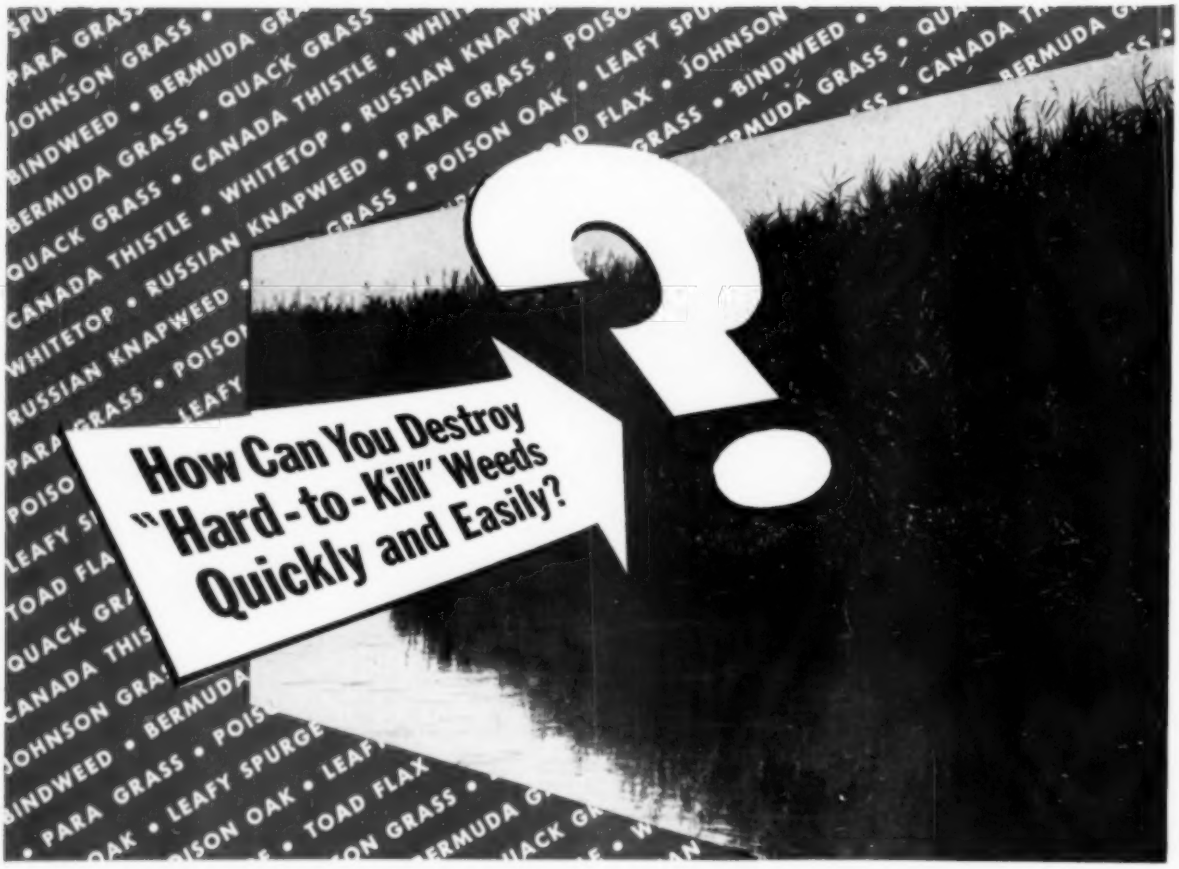
•

Fertilizer Economics Shown

With 275 stockmen as an audience, Colorado A & M College put on a recent demonstration to show that for every dollar spent for fertilizer on mountain meadows, $3 will be produced in beef. Meeting at a ranch east of Hayden, Colo., the stockmen observed results of a test which has been under way since March and will continue for five years.

According to reports, in meadows where 100 pounds per acre of nitrogen were applied, forage yields increased so that 310 more pounds of beef per acre were realized by July compared with beef gains on the check plots. Other pastures treated with 200 pounds of nitrogen per acre, are expected to make an even more impressive record, the researchers said.

The hay yield on land treated at 100 pounds per acre, was 2.8 tons per acre, compared with 1.2 tons on unfertilized plots, it was pointed out.



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Plans Ammonia Storage Plant

A new $200,000 plant for the manufacture of storage systems for LP-Gas and anhydrous ammonia fertilizers is to be built by J. B. Beaird Co., Inc., at Stockton, Calif. J. B. Beaird Co., of California, is a newly-formed, wholly-owned subsidiary of the parent firm, J. B. Beaird Co., Inc., of Shreveport. The California company will build and operate the new plant. Charles T. Beaird is president of the new company which will serve eight states in the mountain and Pacific areas.

•

Chemical Enterprises Expands

Purchase of a substantial interest in the Southeastern Liquid Fertilizer Co. of Albany, Georgia, has been announced by Chemical Enterprises, Inc., subject to final approval. The move was being made to add to the latter's investment in the field of anhydrous ammonia distribution.

The purchase marks the first entry of Chemical Enterprises into the southeast, its distribution of agricultural chemicals and fertilizers having been concentrated in the central states of Indiana, Illinois, Iowa, Kansas and Oklahoma.

According to reports, "Selco" will continue as an independent operating unit. Expansion of operations and additional storage facilities are planned for the Albany plant, with capital supplied by Chemical Enterprises.

•

U. of Cal. to Study Soils

Whether or not various insecticides accumulate in soils is the subject of a long-range program being carried out at the University of California, Davis. The department of soils indicates that although some results are in, the final answers may not be available for a number of years. Present indications are, however, that in alluvial soils it is unlikely that present-day insecticides can accumulate to the point where they will affect soil fertility.

Since new compounds for spraying and fumigating are being developed constantly, the research program may be continued for a long time, a University spokesman said. "Effects on soil fertility are the main study", he said, "but the College is also investigating the reverse question; of how various soils affect the efficiency and lasting qualities of insecticides, nematocides and fumigants."

Concentrated study will be made on the currently popular pesticides such as DDT, dieldrin, aldrin, toxaphene and other chlorinated hydrocarbons, plus volatile fumigants such as ethylene dibromide. Insecticides in concentration may reduce soil fertility by slowing the decomposition of organic matter, thus withholding nutrients in the soil from plant life. Should tests indicate that applications in heavy concentrations (such as DDT is commonly applied) accumulate over a period of years in quantities great enough to reduce soil fertility, the University states that it may develop an antidote to break down the substance and neutralize its action.

•

James E. Hurley Dies

James E. Hurley, 57, secretary-treasurer of the Chilean Nitrate Sales Corporation, New York, died August 12 at his summer home at Setauket, L.I. He studied at New York University and was a veteran of World War I where he served in the Marine Corps.

In 1941, the Chilean Government presented him its Order of Merit for services in connection with the New York World's Fair in 1939-40. Before joining Chilean Nitrate, he was a bank examiner.

Agricultural Chemical Division Moves to Pittsburgh

HERBERT F. TOMASEK

Herbert F. Tomasek, manager of the Agricultural Chemical Division of Pittsburgh Coke & Chemical Co., W. Scott James, Division sales manager, and

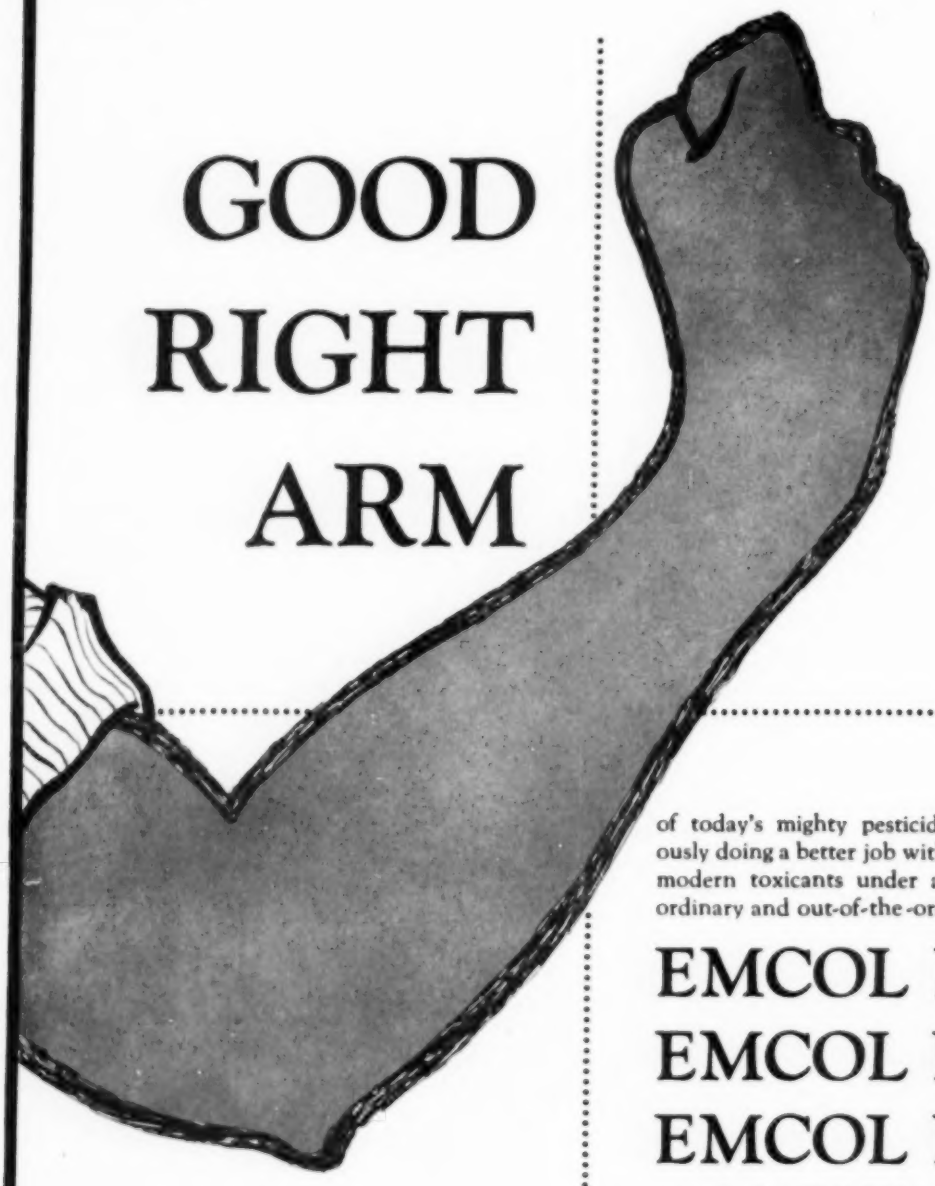
W. SCOTT JAMES

Dr. Joseph B. Skaptason, Division director of new products development are now making their headquarters in Pittsburgh, Pa. where the company has moved since

DR. J. B. SKAPTASON

September 1. Formerly known as Pittsburgh Agricultural Chemical Co., the firm was located in New York City until the recent move.

GOOD RIGHT ARM



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LISTENING *Post*

Antibiotics Tested For Disease Control

This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Plant Disease Survey Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

By Paul R. Miller

REPORTING results of cooperative studies by the Oregon Agricultural Experiment Station and the U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, T. R. Aspitarte, W. B. Bollen, and P. W. Miller state that walnut bacteriosis and filbert bacteriosis, caused by *Xanthomonas Juglandis* and *Xanthomonas corylina*, respectively, are of major economic importance in the Pacific Northwest. While practical control methods have been developed for both of these diseases, they consist primarily of protective spraying, which is costly and time consuming. Methods of control that are simpler to employ, longer lasting, and less costly would be desirable.

The possibility of controlling certain plant disease by the application of chemotherapeutic agents which exert their action inside the host plants has been given increased attention in the last decade by many investigators. Considerable progress has already been made in finding materials and methods of antidoting toxins produced by certain pathogens within the host. Also, certain inhibitive agents, or antibiotics, which inactivate or prevent the multiplication of certain parasites within the host have been discovered recently. Early investigations with antibiotics were not encouraging for these diseases, but since then new antibiotics which seemed worthy of trial against X. *juglandis* and X. *corylina* have been developed. There follows a discussion of plate tests in which some of the newer antibiotics and certain bactericides were tested against these two organisms.

Sterile nutrient agar plates were "seeded", respectively, with freshly made isolates of the two pathogens. Standard discs of certain antibiotics and solutions of certain bactericides of various concentrations (Table 1) in sterile cups were placed on the surface of "seeded" plates. The plates were then incubated at 37°C. for 36 hours, the time required for untreated "seeded" plates to show the maximum amount of growth. Inhibition, as measured by cleared-zone diameters and recorded in five degrees of intensity, is shown in Table 1.

As also shown in Table 1, only mercuric chloride 1:500 and oxyquinoline benzoate 1:1000 completely inhibited both organisms. Aureomycin, streptomycin, terramycin, crystal violet, and "Puratized Spray" caused various degrees of inhibition. Little or no inhibition occurred with penicillin, bacitracin, chloromycetin, sulfanilamide, and "Actidione."

The two organisms studied, which are practically identical culturally, showed differences in their reaction to some of the materials. Penicillin, neomycin, polymyxin B, and chloromycetin at the higher concentrations had some inhibiting effect on X. *corylina* but not on X. *juglandis* (Table 1).

There was some indication of development of resistant types of both organisms or else a loss of potency in the antibiotics. This was indicated by delayed (10 to 20 days) appearance of bacterial colonies in the originally completely cleared zones around discs holding certain antibiotics.

Pecan Scab Control

JOHN R. Large of the Florida Agricultural Experiment Station presents one year's (1952) results of an experiment to control pecan scab by spraying the trees with five applications of "18X Parzate" applied from an airplane at about three-week intervals during the period April 15 to July 25.

Pecan scab, caused by the fungus *Cladosporium effusum*, is the most serious disease of pecans and occurs on several of the paper shell varieties throughout the southern United States. Standard recommendations for control of scab are five or six applications of Bordeaux mixture applied during the summer months from a hydraulic machine. Although this method of application results in commercial control it has several disadvantages: the high pressure spray machines are so expensive that it is not economical for a pecan grower with a small orchard to own one; in wet seasons the heavy machinery can not be hauled through the orchard; two or three men are needed to operate this spray machine; hydraulic application is slow and takes several days at a time when other farm work needs to be done. Airplane spray application solves most of these problems.

In Georgia and Louisiana, pecan insects have been satisfactorily controlled by spraying concentrated insecticides from planes, but to date only preliminary experiments have

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been completed on plane spraying to control pecan scab.

In a 1948 trial in Florida, Moore and Moneymaker pecans were dusted from a plane to control pecan scab, foliage diseases, and insects. Control appeared to be very good early in the season. However, by the last of July, which was a wet month, the scab fungus built up to such an extent that the dusted pecans were no better than the untreated nuts.

In 1951 a grower near Starke, Florida, sprayed his entire orchard of Success pecans from a plane, making three applications of a concentrated solution of "Copper A" compound, the last application being made about August 7. On this date nuts were fairly clean and the orchard was rated as having very good commercial scab control. In late August, scab built up on these trees and the owner applied two more applications of bordeaux mixture with a high pressure ground sprayer. This combination of plane and ground sprayer produced an excellent crop of nuts. An unsprayed Success orchard about a mile away did not produce a crop due to scab.

In the 1952 experiments a ten-acre plot consisting of a block of 45 Moneymaker and block of 75 Moore trees was sprayed five times from a plane. The fungicide was concentrated so that enough chemical for 1800 gallons of dilute spray was suspended in 100 gallons of water. The formula was 36 pounds zineb ("Parzate") plus 18 quarts of Volk summer oil to 100 gallons. The applications were made April 14, May 15, June 11, July 7, and July 25. Eleven pounds of 25% parathion were added to the May and the two July applications to control leaf casebearer and black aphids.

During the early part of the dry summer of 1952 this plane method of pecan scab control appeared to be equal to ground application; but after July 15 the scab built up, on nuts close to the ground, to such an extent that they were considered to be as badly scabbed as on unsprayed trees. However, scab counts made August 28 on the Moore trees indicated 87 percent control for the airplane spraying.

On this date, the scab reading for Moore trees sprayed with bordeaux mixture or zineb ("Dithane Z-78") 2-100 applied with the high pressure ground machine was 100 percent marketable nuts. The Moore mean yield and cracking data are shown in Table 2. The unsprayed Moore trees were small so that the yield is not comparable with that of other trees. However, the important record is the August scab count, 15 percent marketable nuts.

The scab control reading on August 28 for the nuts on the Moneymaker trees was, for the airplane block: 90 percent marketable nuts; for the high pressure ground sprayer: bordeaux mixture 99, bordeaux-ziram split application 100, ziram oil 99.6, and zineb ("Dithane Z-78") 100 percent, marketable nuts. The scab reading for the unsprayed Moneymaker trees was 94 percent marketable nuts. The mean yield and cracking data are shown in Table 3.

With plane spraying, the upper part of the trees showed much better scab control than the lower portion, just the opposite of the usual results when trees are sprayed from the ground. Many limbs in the top of the trees broke off owing to the growth and weight of the nuts, but many of the nuts on the lower branches were severly scabbed. The three

TABLE 1

Effects of certain antibiotics and bactericides on the growth of Xanthomonas corylina and X. juglandis.

Material	Amount or concentration[a]	Degree of inhibition of X. corylina[b]	Degree of inhibition of X. juglandis[b]
Terramycin	10 μ g. (in disc)	++	++
Terramycin	100 μ g. "	+++	+++
Aureomycin	2 μ g. "	++	++
Aureomycin	20 μ g. "	+++	+++
Streptomycin	10 μ g. "	++	++
Streptomycin	100 μ g. "	+++	+++
Neomycin	10 μ g. "	+	0
Neomycin	100 μ g. "	++	0
Polymyxin B	10 μ g. "	+	0
Polymyxin B	100 μ g. "	++	0
Chloromycetin	2 μ g. "	0	0
Chloromycetin	20 μ g. "	+	0
Bacitracin	2 units "	0	0
Bacitracin	20 units "	+	+
Penicillin	1 unit "	0	0
Penicillin	10 units "	+	0
Actidione	2.5 mg. (in cup)	0	0
Actidione	25.0 mg. "	+	+
Mercuric chloride	1:500 "	++++	++++
Mercuric chloride	1:1000 "	+++	+++
Oxyquinoline benzoate	1:1000 "	++++	++++
Oxyquinoline benzoate	1:10000 "	0	0
Crystal violet	1:1000 "	+++	+++
Crystal violet	1:10000 "	0	0
Puratized Spray[c]	1:800 "	+++	+++
Puratized Spray	1:1600 "	++	++
Sulfanilamide	1:500 "	0	0
Sulfanilamide	1:1000 "	0	0

[a] Units or micrograms (μ g.) per disc and mg. or dilution in cups.
[b] 0 = no inhibition; + = less than 1 cm. of inhibition; ++ = 1 to 2 cm. of inhibition; +++ = 2 to 3 cm. of inhibition, and ++++ = complete inhibition.
[c] 5% phenyl mercury triethanol ammonium lactate.

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applications of parathion resulted in satisfactory commercial control of pecan insects.

Under the rainfall conditions in 1952, which consisted of drought in June and July and 15 days of rain in August, plane spraying with zineb ("Parzate") resulted in commercial control of pecan scab at a cost that was about equal to the cost of other conventional ground spraying, $25 per acre for the five spray applications.

Eight Moneymaker and eight Moore trees were selected at random from the airplane spray block. The mean yield this season from the eight 35-year old Moneymaker trees was 144 pounds. The mean yield from the eight airplane sprayed Moore trees was 52 pounds.

The data indicate that the 134 pounds of nuts from the unsprayed Moneymaker trees were smaller and of poorer quality than the nuts from the sprayed trees. On unsprayed Moore trees nuts which remained until harvest were of almost as good quality as those from the sprayed trees. The unsprayed trees were almost defoliated by foliage diseases before the last of September, whereas the sprayed trees held their foliage until frost, about the middle of November. These data confirm earlier observations that pecan scab is more difficult to control on Moore trees than on Moneymaker. The pecan scab control obtained by plane

TABLE 2

Comparison of scab control, yields, and sizes of Moore pecans when sprays were applied with hydraulic and aeroplane sprayers. — Monticello, Florida, 1952.

Treatment (6 trees in each)	Type of machine	Number of spray applications	Percent marketable nuts. First 3 scab classes	Mean yield in pounds per tree	Number nuts per pound	100-nut cracking sample Percent Kernel	Percent culls
4-1-100 bordeaux mixture, 6-2-100 bordeaux mixture, plus parathion 2-100	High pressure hydraulic	6	100.0	58.0	103	39.7	20.0
Zineb (Dithane Z-78) 2-100 plus oil 1 qt. to 100 plus parathion	High pressure hydraulic	6	100.0	80.7	108	36.2	24.0
Zineb (Parzate) 36-100 plus oil 18 qts. plus parathion 11 lbs.	Aeroplane	5	87.0	51.6	99	35.7	36.0
Not sprayed[a]			15.0	5.0	107	36.5	42.0
Not sprayed				66.0	124	33.5	31.0

[a]Small trees were used so the comparison of the yield is not correct, however, the August 28 record indicates the severe infection of scab on the unsprayed trees.

TABLE 3

Comparison of scab control, yields and sizes of Moneymaker pecans when sprays were applied with hydraulic and aeroplane sprayers.—Monticello, Florida, 1952.

Treatment (6 trees in each)	Type of machine	Number of applications	Percent marketable nuts. First 3 scab classes	Mean yield in pounds per tree	Number nuts per pound	100-nut cracking sample Percent Kernel	Percent culls
4-1-100 bordeaux mixture, 6-2-100 bordeaux mixture, parathion 2-100	Hydraulic	6[a]	99.4	115.0	79	40.7	14.0
Bordeaux-Ziram Split application	Hydraulic	6	100.0	102.0	75	45.0	6.0
Ziram plus oil	Hydraulic	6	99.6	139.0	88	43.6	5.0
Dithane Z-78 plus oil	Hydraulic	6	100.0	131.0	75	41.9	12.0
Parzate 36-100 plus oil 18 qts. plus parathion 11 pounds-100	Aeroplane Concentrate	5	90.0	144.0	71	40.9	7.0
Not sprayed			94.0	134.0	87	38.5	18.0

[a]Spray schedule consisted of one prepollination followed by 5 post-pollination applications. Prepollination date was April 11. Post-pollination dates were May 5, June 5, July 5, July 7, July 25 and August 6. The final aeroplane application was made July 25.

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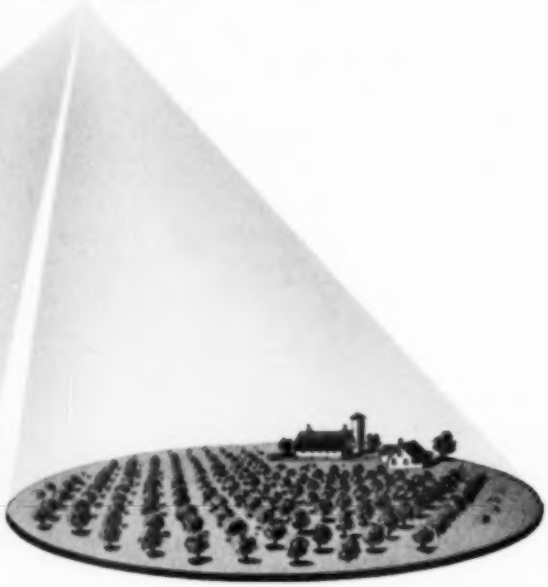

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spraying with five applications of 18X ("Parzate") was rather promising in the dry season of 1952, but this may not be true in a normal wet summer. The plane spraying experiments will be continued in 1953.★★

Insects Make New Appearances on Many Crops

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Mr. Dorward is connected with the Division of Insect Detection and Identification, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington. His observations are based on latest reports from collaborators in the U.S.D.A.'s pest surveys throughout the United States.

By Kelvin Dorward

BY early August, third brood codling moth larvae were making entrances in apples in Jackson, Union, and Johnson Counties of Illinois. This brood was progressing rapidly in western Kentucky and southern Indiana. The third brood attack was expected to be severe in the Orleans, Indiana area and will likely extend farther north than usual. In Delaware, a partial third brood is expected. In Massachusetts, second brood was very active and this brood was continuing to cause injury in central and southern New Jersey counties. In the Yakima, Washington area, second brood appearance was expected to be in early August. Subnormal temperatures since April are responsible for the late date. Codling moth infestations have been very light this season in the Willamette Valley of Oregon.

Spider mites continued to be a problem on fruit in many states during the first part of August. In Massachusetts the two-spotted mite was increasing rapidly in both peach and apple orchards and the European red mite still required attention. In Illinois, Kentucky and Indiana, mites were on the build-up and present a serious threat. In central Pennsylvania, injury was severe where no miticides were used and control was still a problem in some New Jersey orchards. Damage was also reported from Utah. The two-spotted mite was abundant in Idaho, but decreasing in West Virginia and Saratoga and Orleans Counties, New York.

Red-banded leaf roller second brood activity was at its peak in central and southern New Jersey by early August with little injury at the time of the report. In Dutchess County, New York, this insect was a more general problem than last year.

The pear psylla which has been known to be in northern Idaho for over ten years is now in southwestern Idaho, having been found in Canyon County. This insect which was reported from California for the first time this year has now been found in three locations in Del Norte County, California.

Other fruit insects reported on the increase or causing concern during the first part of August included the Oriental fruit moth in Washington where the third brood was appearing in much larger numbers than in many years. The mealy plum aphid increased to tremendous numbers in several Prosser, Washington area apricot and prune orchards. Unsprayed trees in the Willamette Valley of Oregon were heavily infested with cherry fruit fly.

Vegetable Insects

THE first field infestation of the tomato russet mite in Delaware was found near Bethel, Sussex County, August 12, 1953. The first find in the State was reported earlier this year from a greenhouse located near Wilmington. Maryland also reported its first definite record of this pest this year. Infestations have been found in Dorchester, Harford, and Carroll, Worchester and Wicomico Counties. Infestations are again occurring in areas of New Jersey and Pennsylvania where the mite was found for the first time in 1952. Indiana reported isolated infestations, while Illinois had severe damage to tomatoes in Henderson County and Iowa reported damage to canning tomatoes at Columbus Junction.

The Colorado potato beetle was noted in potato fields throughout the Red River Valley in early August. Small populations were also in all of the western Nebraska potato area with control necessary in some fields. In eastern Colorado, larger numbers of the insects were present on native weed hosts than usual, but little damage occurred in treated commercial potatoes. In the southwestern area of Idaho the beetle was the lightest since 1950, but control was necessary on spotted infestations in the south central area. Maine also reported spotted light infestations.

Another potato insect causing damage during August was the tuber flea beetle in untreated fields of the Nebraska North Platte Valley and in Weld County, Colorado. The potato flea beetle was also abundant on potatoes in Indiana, Minnesota and Pennsylvania. In northwest Pennsylvania, potato aphids were increasing in most fields. Leafhoppers were causing damage to some potatoes in Indiana, Iowa, Minnesota and Michigan.

Hornworms were more abundant than usual in south central Pennsylvania and a new brood was beginning on tomatoes in Worchester County, Maryland. Second-generation eggs were common in most plantings in Delaware south of Dover.

Light local infestations of the Mexican bean beetle have been reported from Rock Falls, Illinois which is the most northern point ever recorded for the insect in that state. In Colorado, the beetle was causing more damage, despite controls, than for several years. Damage was also reported from Virginia, Delaware, New York and Nebraska. In Michigan there was a full second brood

(*Turn to Page* 151)

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WASHINGTON *Report*

TOP management in the agricultural chemical industry will be faced with a tougher selling job next year, assuming present farm income trends continue. Many farm economists are revising their income estimates downward for next year in view of the sharp break in prices noted thus far in 1953.

It was thought earlier that farm income would be down around 5% compared with last year, but it now appears that the drop will be double this amount . . . down some 2 billion dollars. In contrast, the average individual income for the U. S. this year will be up 7%. The farmer's position is deteriorating not only because his prices are falling, but because labor costs and other "sticky charges" for the things he buys are staying up. Pesticides are one big exception, where price cutting in some lines is handing farmers a bargain.

* * *

Farm leaders are pinning a major share of the blame on falling exports of agricultural commodities—now down 15 to 25 percent. Pres. Eisenhower recently came out in support of the Lewis Douglas report calling for freer world trade, and the report is gaining support in principle among some farm leaders. They feel that unless trade can be expanded, farm income will decline even more despite government price propping programs. Hence, more farmers may be found around conference tables where tariff and general trade policies are discussed. Consequently, the size of the domestic market depends on the outcome of negotiations which are likely to receive major attention from Congress when it returns.

* * *

Some pesticide manufacturers are taking a closer look at the sales and public relations programs employed in the fertilizer industry. Continued increases in fertilizer consumption in the face of falling farm income demonstrate that more farmers really believe that the use of fertilizer makes them money.

While the use of pesticides is more complex, there is a feeling that too much emphasis has been placed on merely killing bugs—that more research is needed to demonstrate the amount of money a farmer makes when he follows recommended spray programs. Since infestations vary considerably each year, data is needed on money made per dollar invested over a two to five year period.

Chemicals with instant kill are spectacular, but unless they are integrated into a profit-making program they may be looked upon by growers as little more than novelties. Since more hands will be reaching for farm dollars, the man who shows promise of a real profit is most likely to get the business.

* * *

Increasing amounts of nitrogen fertilizer may be needed soon for the rehabilitation of South Korea. Projected requirements call for 100 to 125 thousand tons of nitrogen by 1957-58, assuming continued peace, according to Hilliam F. Watkins, Chief, Fertilizer, Seed and Pesticide Branch of Stassen's FOA. Current shipments total about 50,000 tons a year.

Watkins visited Korea just before the outbreak of hostilities. At that time, shipments of nitrogen had reached a peak of 110,000 tons. Deliveries in 1946 were approximately 50,000 tons. Nitrogen is the principal fertilizer material needed by South Korea, although phosphorus and potash are important also.

By itself, this new requirement would not drain much U. S. production in view of the industry's major expansion program. However, military requirements are currently undergoing review and it may be some time before a final decision is made. The tentative program, previously reported, projected needs through 1955. The plan would double the amount of nitrogen for military use the final six months of this year, compared with last year. A further increase would be made in the first half of 1954 when nitrogen requirements would triple compared to the first half of this year. Production would then continue at a high rate.

* * *

The general opinion held in Washington is that the Senate hearings on ammunition revealed serious shortages regardless of the political considerations involved. These shortages apply to both Korea and Europe as well as to reserves and rate of production in the United States. It is believed the "front line" supplies have greatly improved, at the expense of draining the pipelines.

Nitrogen producers are not optimistic about the chances for any radical reduction in military needs. It is possible the schedule may be slowed and extended, but even if this occurs, the rate of ammunition production will no doubt increase in the coming months and stay high for a long time.

* * *

Many will remember the late Dr. S. A. Rowher, BEPQ, commenting before several important industry meetings that "people have to choose between insect fragments and chemical residues in their food." The next few years may well see this choice made. As it stands today, the government insists that food be sold not only with less insect fragments, but also without pesticide residues. There are exceptions where residue tolerances either are permitted or are expected to be announced by the Food and Drug Administration, notably on fresh fruits and vegetables.

Apparently grain is to be the subject of the next cleanup campaign. It is now recognized by government officials that it will be a slow process and that while progress has been made in the sanitation of bread since the hard bis-

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cuits of sailing ship days, it will be a long time before we are free of insects. Some agricultural leaders are thinking of grain cleanup in the same terms as the control of tuberculosis in dairy cattle—10 to 15 years.

* * *

Rodent damage appears to come first, with a crackdown probable next year. The weevil problem does not lend itself to quick solution. First permitted residues must be set. Since most farmers are not equipped to fumigate, their spokesmen wonder how far they can go in meeting any strict regulations without the increased use of chemicals.

The latest Washington meeting of the Grain Sanitation Advisory Committee, with Dr. Glenn King, scientific director of the Nutrition Foundation as chairman, was held in a friendly atmosphere. Great reliance is placed on the Education sub-committee, headed by W. H. Bowman, Millers National Federation. Dr. Harold Macy, Institute of Agriculture, University of Minnesota, heads the rodent control sub-committee. Dr. R. C. Smith, Kansas State College was named chairman of the sub-committee on insect control.

* * *

The various phases of research as it applies to sanitation of foods are under continuous review by the Executive Advisory Committee of the Food Industry Liaison Group headed by Herman Falker, vice-president of the Millers National Federation. This group is keeping the food industry advised of research developments in the food sanitation field which covers a wide area.

Underlying this whole subject is the sometimes overlooked point that farmers are being forced by economic conditions into more intensive production—higher yields. Agronomists and entomologists are convinced that as we intensify farm production further, we create even more favorable conditions for insects and diseases. They believe more pesticides will be needed.

Thus, although the essential yield increases can be achieved by better insect control alone, the Committee and those concerned in government and industry do not have unlimited time to act. Farmers will force the issue or more accurately — economic necessity and nature will force it.

* * *

Lea S. Hitchner, Executive Secretary NAC, represents chemicals on the farm Liaison Group. Other members are:

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* * *

With plans under way for the 1953 pesticide selling season, the USDA underscores the distinction between registration and recommendation of chemicals. The two are completely separate and administered by independent bureaus.

Registration is handled by Dr. W. G. Reed, Production and Marketing Administration under terms of the Federal Insecticide Act of 1947. Registration means in short that a material has economic value and that necessary precautions for safety and residues are contained on the label. It is a device to bring the economic poison to the attention of the USDA and to furnish an opportunity to correct faults in labeling. The law forbids the label to say that the product is registered, for fear that it would imply USDA recommendation. Neither is the fact of registration made public by the Department although companies are at liberty to so inform dealers and agricultural leaders.

* * *

BEPQ, on the other hand, does recommend chemicals for specific purposes. Often, considerable time and testing are required before such recommendations are made.

•

Geigy Co. Honors Wm. Zipse

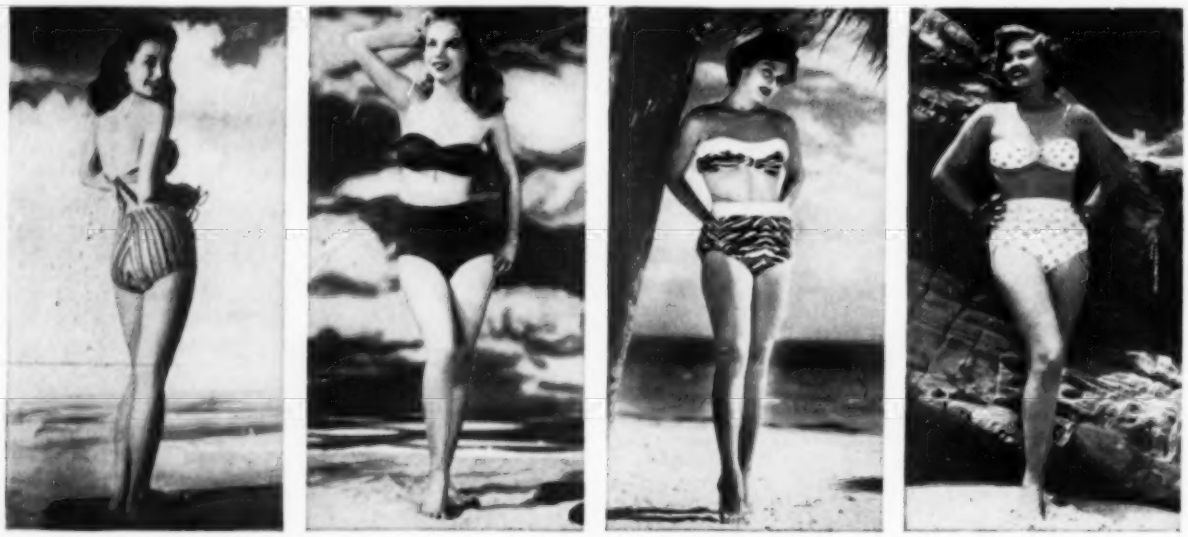
WILLIAM F. ZIPSE

Wiliam F. Zipse, president of the American subsidiary of Geigy Co., Inc., is being honored by the firm and associates in the chemical industry, upon his completion of fifty years with the company. He was recently given a dinner at New York's Manhattan Club by directors of the company.

Joining the company in 1904 as an office boy of 14, the president had the distinction of advancing in 13 years to the position of sales manager. He became president in 1943.

His career spans the greatest era in chemical history and has seen his company make important contributions including the origination of DDT insecticides, Butazolidin, the arthritic drug and many other basic developments in both agricultural chemicals and in dyestuffs.

The expansion of the company during the past half-century has been considerable, including the establishment of branch offices and manufacturing plants in many of the country's large cities and agricultural areas. The parent firm of Geigy, in Switzerland, has been operating for the past 200 years.



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Dust Base, 12% Gamma

LINDANE
Technical
Dust Base, 25%, 75%, 95%
Emulsifiable Concentrate, 20%
Oil Concentrate, 20%

LEAD ARSENATE
Stapdard
Astringent
Basic

CALCIUM ARSENATE
Standard
Low Lime

PARATHION
Dust Base
25% Emulsifiable
2 & 4 lbs. per gallon Emulsifiables

FERBAM
Dust Base (76% Ferric Dimethyl Dithiocarbamate)

ZIRAM
Dust Base (76% Zinc Dimethyl Dithiocarbamate)

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Acid, and Technical Esters

2,4,5-T
Acid, and Technical Esters

TCA-SODIUM SALT
90% Dry Powder
50% Liquid Concentrate

POTASSIUM CYANATE
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Weed Killer

URAB†
(3 (phenyl)-1, 1-dimethylurea)

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Sure-Drop† (Chlorate-Borate Powder)
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GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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Suppliers' BULLETINS

Crusher Handbook Is Offered

Information on how to make the most efficient and satisfactory application of various types of crushers to specific jobs is contained in a new booklet published by Pennsylvania Crusher Co., Philadelphia. Discussed in detail are the factors which influence operation, such as power consumption, parts wear, maintenance costs and uniformity of product. A check list is also provided to help to determine the most useful type of crusher for various jobs. Detailed descriptions are included on hammermills, jaws, impactors, granulators, gyracones, Bradmills, Bradford Breakers, Bradford Hammermills and a number of other types of single rolls. Copies of the handbook are available from Pennsylvania Crusher Co., 1755 Liberty Trust Bldg., Philadelphia 7, Pa.

•

Offers Large Com-Bin Feeder

Pulva Corporation, Perth Amboy, N. J., has announced a new "Com-Bin" feeder said to be the largest made to date. Now in service, it takes intermittent charges of triple superphosphate, each weighing approximately 10,000 lbs., and discharges the material to a belt conveyor at the rate of 65 tons per hour. The entire bin and discharge table revolve, the makers say. The top of the cylinder is 12 feet in diameter and the discharge table is 11 feet. The bin holds approximately a 15 minute supply when discharging at the rate of 65 tons per hour.

The feeder consists of a cylindrical shell mounted concentrically on a rotating vertical shaft by means of spider arms. Mounted on the same shaft, below the cylinder, is a circular plate larger in diameter than the cylinder. A gap exists between plate and cylinder and a stationary plow set at an angle, extends through the gap. Discharge rate can be varied.

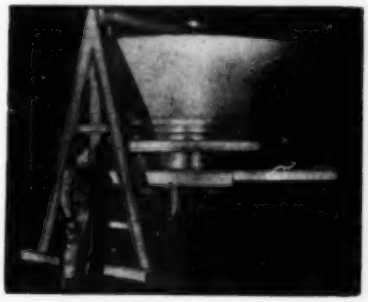


Photo above shows size of "Com-Bin" feeder as compared to height of man. Feeder discharges material to belt conveyor at rate of 65 tons per hour.

The company makes smaller sizes of feeders for various needs in the fertilizer industry. Full details are available from the company, 550 High Street, Perth Amboy, N. J.

•

Offers Carrier Bulletin

Attapulgus Minerals & Chemicals Corp., Philadelphia, has published a revised bulletin describing granular Attapulgus carriers for pesticides. Information is presented on screen analyses, number of granules per unit weight, sorptive capacity of the carrier, how it releases the toxicant, application methods and equipment and formulation.

Under the latter, the bulletin states that formulations with the granular Attapulgus may be made with regular impregnation equipment, but some adjustments may be necessary because of the increased resistance to mixer blades in the process.

The material is described as having a bulk density of from 32 to 34 pounds per cubic foot, packed. Write for bulletin describing "Granular Attapulgus For Soil Pesticide Formulations", care of Attapulgus Minerals & Chemicals Corp., Dept. P, 210 W. Washington Square, Philadelphia 5, Pa.

•

Bulletin on New Bagger

A new bulletin by Richardson Scale Co., pictures and describes the company's semi-automatic gross bagger. This new hand-operated scale weighs and fills either textile or multiwall bags.

Besides design features, the bulletin discusses speeds, capacities and accuracies of the bagger. It describes the bagging operation, and lists complete specifications. Included also is a dimensioned engineering drawing showing top and side views. For copies of bulletin No. 5301, write to Richardson Scale Co., Van Houten Ave., Clifton, N. J.

•

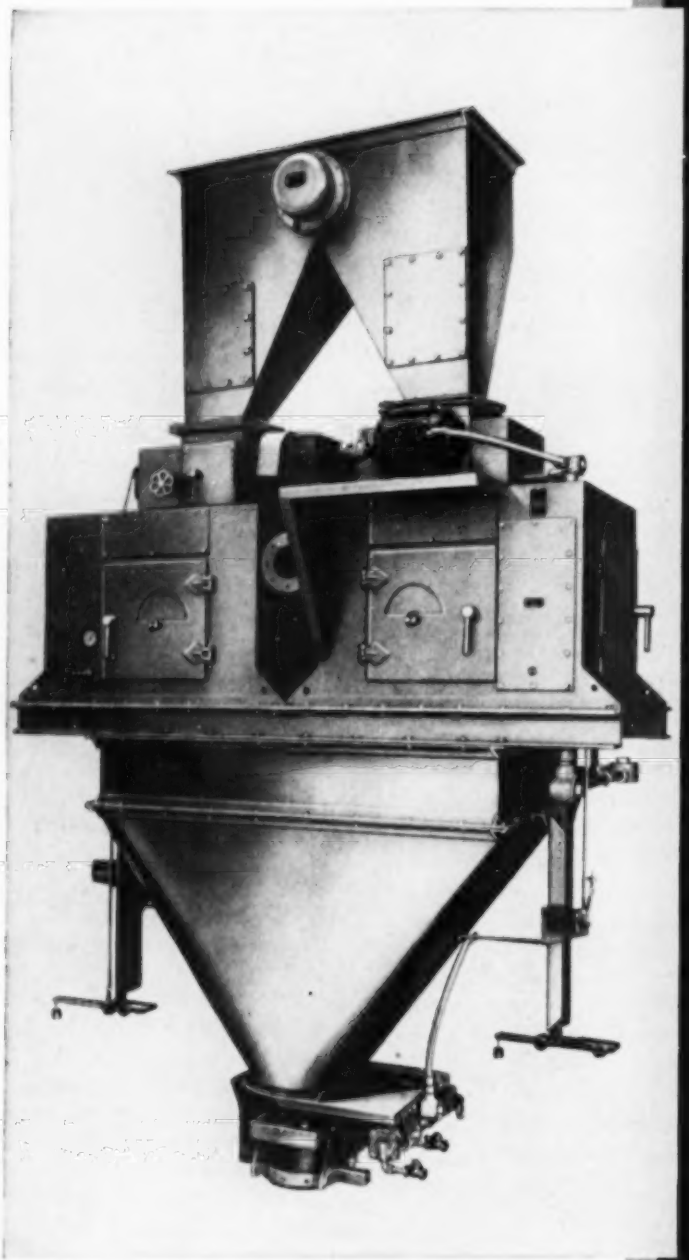
Lists 2,4-D Effect on Weeds

A revised technical bulletin on 2,4-D is available from Monsanto Chemical Company's Organic Chemical Division, the company has announced.

The bulletin contains a list of nearly one thousand weeds classified according to their reaction to this herbicide. Physical and chemical data on the four chemical forms of 2,4-D, (Acid, sodium salt, isopropyl ester and butyl ester) are given, as is biological data, methods of application and the listing of weeds.

These are subdivided into annual, winter annual and biennial weeds; perennial weeds; and woody plants. The weeds under each subhead are divided into four groups: very sensitive; sensitive; semi-tolerant; and resistant.

Copies of the booklet are available from the company's Organic Chemical Division, 800 N. Twelfth Blvd., St. Louis 1, Mo.



Designed for bagging fertilizers with *speed* up to 20 50-lb. or 80-lb. bags per minute[1]; *accuracy* usually to the split ounce, with a maximum range of 2 to 4 ounces; *savings* to $15 per hour[2] using economical open-mouth bags . . .

. . . this is the Richardson E-50 Duplex Automatic Bagging Scale . . .

. . . dust-tight, corrosion-resistant with *stainless steel.* The E-50 is also built in single and triplex units. Bulletin 0552 gives complete specifications—we'll be glad to send you one.

[1] Slightly slower on 100-lb. bags
[2] Cost analysis figures on request

Richardson

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8776

Krilium for Tobacco Plants

Tobacco growers will be able to get their crop off to an earlier start, and with loss of fewer plants, through the use of synthetic soil conditioners in tobacco plant beds, according to results of two-year field tests in Lexington, Ky., announced recently by Monsanto Chemical Co., St. Louis, Mo.

Development of improved root systems by plants grown in soil treated with Krilium soil conditioner is given as the principal reason for the advantages by general manager of the merchandising division, R.L. Brandenburger. He reports that "tobacco plants are more abundant, sturdier and ready for setting as much as ten days earlier than plants grown in untreated soil".

It is further reported that from five to 25 per cent less replanting is necessary with plants from beds treated with Krilium; also that the use of the soil conditioner permits establishing permanent plant beds.

Monsanto reports that the increased yield and quality obtained from only five per cent greater survival of plants in the field will often more than offset the cost of Krilium used in treating the plant bed.

The picture at right was taken in the experimental field. Plants to right of stake were grown in treated bed. Those to left of stake in untreated bed. Earlier setting made possible by Krilium is said to result in earlier maturity in the field.

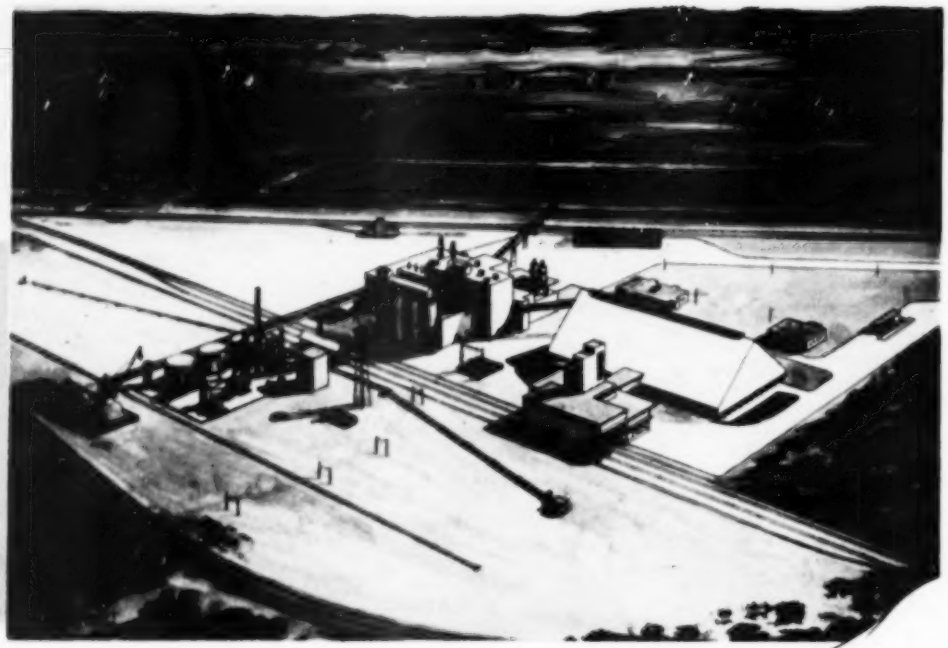
Krilium is recommended at the rate of ten pounds for each plant bed, usually nine feet wide by 100 feet long.

According to the Monsanto report, the soil conditioner may be successfully applied whenever the soil can be worked into a good seed bed, but conditions are most favorable during the fall months. It is claimed that soil treated with Krilium will allow earlier working of the bed prior to seeding in the spring.

It is reported also that in treated beds, plants are easier to pull from the crumbly soil and are not stripped of their root hairs, on which they depend for nutrients and water. It is believed this accounts for the fact that plants from treated beds take root more readily than those from untreated beds, and get off to a quicker start with better survival.

Experimental tests were conducted with the cooperation of state experiment stations in major tobacco producing areas. Monsanto reports that test results were corroborated under typical tobacco-growing conditions on farms in 19 Kentucky counties.

"Progress through Chemistry"



Architect's drawing of the new ten million dollar fertilizer plant of The Davison Chemical Corp. located near Bartow, Florida. Completely designed and engineered by The Dorr Company's Consulting Engineering Dept., the plant's capacity is 200,000 tons of triple superphosphate per year, utilizing The Dorrco Strong Phosphoric Acid and Granulated Fertilizer Processes.

The Davison Chemical Corporation's new Dorr-designed plant will produce

200,000 TONS PER YEAR

of triple superphosphate

The Davison Chemical Corp., entering the concentrated fertilizer field for the first time, is making skillful use of Dorr knowledge and methods.

Dorr knowledge comprises 35 years of experience — gained through furnishing equipment or designing and constructing plants for the production of concentrated granular fertilizers by the wet process. Dorr methods include such refinements as the Dorrco Strong Phosphoric Acid Process to be used at Davison . . . the only process operating today which will economically and reliably produce 32 to 33% P_2O_5 phosphoric acid with a single stage of filtration.

In fertilizer plant design, facilities are important too. Dorr's Consulting Engineering Department is staffed by engineers fully qualified to handle all phases of fertilizer plant design — from economic analysis to supervision of initial operation. And, it has at its disposal complete facilities for any laboratory testing and pilot plant study which may be indicated.

If you are considering entering the fast-growing chemical fertilizer field — or if you plan to expand your present production facilities — it will pay you to check with Dorr. Write for Bulletin #8000, or better still, let us send an engineer to discuss your problem from the standpoint of economics and process. There's no obligation, of course.

Free flowing granules . . . important characteristic of concentrated chemical fertilizers produced by Dorr-designed plants.

Better tools TODAY to meet tomorrow's demand

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Through the SIFTER...

CONFLICTING reports continue to come from the field on 1953 pesticide business, although the overall picture cannot be described as other than rather gloomy. Some producers of basic raw materials are reported to have shut down plants in the face of the poor market situation, with others reported to be considering similar action. On the other hand another observer reports that consumption of insecticides this season has been heavy, and only the surprising ability of the American chemical industry to produce can be held accountable for the current surplus of stocks in primary hands.

Meanwhile reports from growing areas describe mounting crop losses due to insect pests. The U.S.D.A. reported in mid-August that the boll weevil situation continues serious in the cotton states. In North Carolina, checks in 68 untreated cotton fields showed 100% infestation. Grasshopper damage to corn and alfalfa is reported heavy, and in Maine and Washington aphids are reported to be damaging potatoes severely. In the south, fall army worms are reported to be causing severe damage to sugar cane, corn and grass crops.

While it is difficult to reconcile reports of heavy crop damage with excess insecticide stocks, it is apparently the old story of not having the right pesticide on hand, at the right place, at the right time, in adequate volume. The very fact that farmers and distributors have known all along that there was ample productive capacity for their insecticide needs has in itself affected sales adversely. Buying, as a result, has been on a hand-to-mouth basis, and often insect outbreaks have found distributors short of spot stocks. By the time new supplies have been mixed and shipped in, they have in many cases arrived too late to do the farmer maximum good, and too late to help the mixer's sales picture.

* * * *

One note of encouragement is that, perhaps as a result of slack early season buying, activity on the sales front has continued much longer than in other years. It has been a late market, but it's still continuing, and the best proof is that seven of nine of the insecticide "minute men" we called last week were either just leaving, en route or just back from a trip south.

* * * *

The huge experimental farm setup at Beltsville operated by the U. S. Dept. of Agriculture is the subject of a feature article in the August issue of "The National Geographic Magazine." The Beltsville farm, the largest agricultural experimental center in the country, covers 11,000 acres, has 950 buildings and employs 2,000. In 1952 there were 10,000 visitors to the farm. The article recalls that the first tests of DDT in the U. S. were made at Beltsville, that the aerosol insecticide bomb was developed there and that the first application of 2,4-D as a herbicide was another product of Beltsville studies. In the course of testing 2,4-D, Dr. Ezra J. Kraus took capsules of 2,4-D daily for three weeks, without bad effect, to determine whether or not the product would present any toxicity hazard in use. The article in the "Geographic," accompanied by numerous color illustrations, was prepared by Samuel W. Matthews.

* * * *

Perhaps it's seasonal. There seems to be a wave of articles in the general circulation magazines dealing with agricultural chemicals and their application. "I Fly With Death" by Wayne Brown is the lead feature in a recent issue of the *Saturday Evening Post*. The article incidentally features the dramatic side of the business, and before our author gets beyond page two he has already cracked up three dusting ships. If all duster pilots fly with as little attention to routine precautions as author Brown, we can well believe his statement that 49 duster pilots were killed last year.

* * * *

The Fortune staff is also reported to be working on a lengthy feature article on agricultural chemicals, which is at the moment tentatively scheduled for their October issue. Likewise, the issue of "Collier's" for August 21, carried an article, "The Villain Still Pursues Us", describing the work of entomologists in seeking answers to questions regarding the resistance of flies to various toxicants. The piece is well illustrated with color photos by Dr. Roman Vishniac, well-known New York entomologist-photographer whose pictures have appeared in "Agricultural Chemicals" from time to time. Author of the article is Herbert Yahraes.

* * * *

And of course there have been countless articles on soil conditioners. "Are Soil Conditioners Practical" from the "Scientific American" emphasizes that "there is a long road of research ahead before these new chemicals may be said to be practical on a wide scale." Users are cautioned not to expect miracles, and are reminded that "hard, lumpy, sandy, slaked or 'run-together' soils cannot be made into soil of good tilth simply by the application of the chemicals." If not worked in, the conditioners act only on the top eighth of an inch or so of soil. It is noted that tests this past season at the Connecticut State Agricultural Experiment Station showed that some conditioners, if applied in excessive quantity, "retarded germination, repressed plant growth and produced lower yields than untreated plots." The largest quantity applied in these tests was 3,125 lbs. per acre to a three inch depth. Better results and yields were obtained by applying amounts ranging from 500 to 1,000 lbs. per acre to a three inch depth, depending on type of soil, the article reports.

* * * *

The second year for soil conditioners has been a keen disappointment, according to the frank statements of several of the firms marketing these new products. Sales were definitely far below expectation. "I believe in the chemistry of synthetic soil conditioners", writes one marketer of the products. "There is no doubt in my mind that the products put out by the leading manufacturers (Monsanto, DuPont, American Cyanamid, B. F. Goodrich, American Polymer and others) all work. However I am certain that they were put on the market prematurely,—not before the products were adequately tested, but before a careful merchandising pattern was established. This led to some completely unreasonable and inaccurate statements, especially by a mail order house which has since gone out of business. These extravagant

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A FLY REPELLENT THAT WORKS

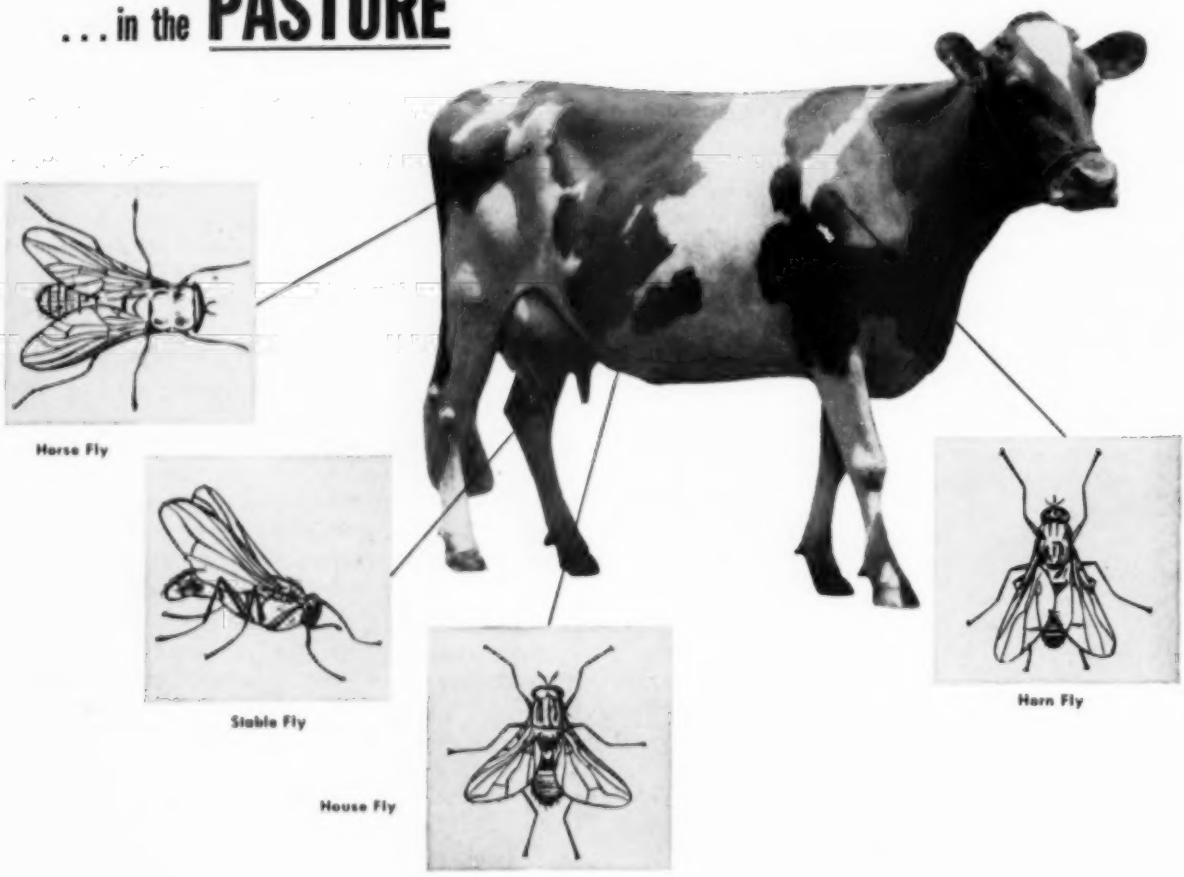
...in the BARN and

...in the PASTURE

CRAG FLY REPELLENT (butoxy polypropylene glycol) can add new sales appeal to your oil-based, emulsifiable or automatic-sprayer formulations. Because of its repellent and synergistic properties, CRAG Fly Repellent-toxicant combinations provide economic protection against flies both in the barn and pasture.

CRAG Fly Repellent offers other benefits as well. It is a solvent for all ingredients commonly used in animal sprays. If cloudiness, separation or settling is a problem in your present formulations, try CRAG Fly Repellent as a coupling agent to improve appearance and storage characteristics.

START NOW to give your dairy and livestock sprays improved performance with this colorless, odorless repellent.



Horse Fly

Stable Fly

House Fly

Horn Fly

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claims unquestionably had an adverse effect on the consuming public as a whole.

"It was the impression of a number of people in this industry that we were going to concentrate on the back yard market first because, frankly, there was a premium price attached to this market. Then two or three years later we were going to get the cost down preparatory to attacking the real market which we figured would be the bulk agricultural market. It is entirely possible that by next season several people who expect to stay in the soil conditioning picture, including ourselves, will actually be entrenched in the bulk agricultural market."

When "Grub" Leonard, executive vice-president of Tobacco By-Products, and a past president of the N.A.C.A., announced his retirement last month, he indicated that his future schedule would provide a little free time for fishing. And he apparently wasted little time in getting on the business end of a fishing rod, for we just had a post card from him from Pennwater, Mich., which pictured the very fish pole he was talking about,—and a nice mess of trout.

* * * *

Buyers of cotton poisons should have no problem in remembering the phone number at the Newark, N. J., plant of Diamond Alkali Company's organic chemicals division. — It's Market 4-3-5-40.

* * * *

In spite of drought in the southwest, the U. S. seems to be in for another bumper cotton crop this season. U.S.D.A. estimated as of August 1 that this year's cotton crop would reach 14,605,000 bales. This compares with 15,136,000 bales in 1952 and 15,144,000 bales the year before. The 1942-51 ten year average was 12,215,000 bales. With the cotton crop reaching bumper proportions for the third year in a row, marketing quotas seem almost inevitable for next season.

* * * *

With acreage cuts in prospect for wheat, and perhaps for other major crops as well, the outlook could be quite favorable for increased use of both fertilizer and insecticide next season. If the price support set-up is such that farmers are encouraged to grow more crops on limited acreage allotments, added incentive will exist to use more chemicals to increase yields.

* * * *

Dr. Stanley Freeborn of the University of California, Davis, has been selected to succeed Dr. Arthur Lindquist as chairman of the Pacific Branch of the Entomological Society of America. Shortly after election as chief executive of the Pacific Branch at the recent Lake Tahoe meeting, Dr. Lindquist was transferred to Washington by the B.E.P.Q. No date has been selected yet for next year's meeting of the west coast branch, but it is reported that a likely meeting place is Bend, Oregon. Bend is centrally located in the state, is accessible by air, and would be handy for those driving in from surrounding states. Victoria was being considered as a meeting site, but has been abandoned since there will be a meeting of a Canadian entomological group there close to the same date the Pacific Branch normally has its session.

* * * *

Each day brings its new report of another chemical company starting production of anhydrous ammonia. Will this be another DDT or BHC by 1955? Demand for ammonia from the American farmer seems still to be a long way from being satisfied, but we have just had a couple strong object lessons in how easy it is to reach a state of heavy overproduction when every one and his brother starts to invade a promising new field. When it starts to produce in earnest, the American chemical industry can surprise even itself.

* * * *

One of the best known and most widely patronized retail stores in the country for the distribution of small packages of insecticides, fungicides, soil conditioners, etc. for the back yard gardener closed its doors last month when Peter Henderson Stumpp & Walter discontinued their shop at 132 Church St., New York City. It had long been a popular shopping center for suburban gardeners. The firm will continue to operate its suburban stores on Long Island and in Westchester County, to which much of the past patronage of the New York store has apparently shifted in recent years.

* * * *

Another of life's minor mysteries is cleared up, and we must face our readers once more with a red face. Remember last month we voiced our suspicion that National City Bank might just have dreamed up that unnamed insecticide firm that they featured for a time in the commercial accompanying their nightly television news broadcast around the New York area? Well, they didn't dream up the company at all. It was strictly the McCoy. Or rather it was Chemical Insecticide Corp. of 129 Montague St., Brooklyn, whose owner, A. M. Livingston, phoned us and tipped us off that it was his company to which NCB made the loan, starting them in the insecticide business. Our apologies to NCB, and to Chemical Insecticide Corp. for ever suspecting that they didn't exist.

•

Kans. Names Fertilizer Comm.

The Kansas State Board of Agriculture has appointed a six-member state advisory committee to help with regulations pertaining to liquid fertilizer materials. The committee was provided for by the state's 1953 Legislature.

Representing Kansas State College will be William H. Honstead, associate professor of chemical engineering. Others named to the board include Clyde Latchem, state fire marshal; George F. Klein, Jr., chief engineer, Spencer Chemical Co., Pittsburg, Kansas, to represent the state's manufacturers; Floyd E. Reinhardt, R. & R. Tank & Supply Co., Pratt, Kansas, representing tank makers; Ray Roeder, special agent of Hartford Accident and Indemnity Co., Topeka, Kansas, representing the insurors; and George O. Gigstad, Nortonville Nitro Fertilizer Co., Nortonville, Kansas, representing distributors.

Function of the committee will be to pass on proposed regulations for the safe handling, storage and transportation of liquid fertilizer materials in Kansas.

•

New Fertilizer Co. Formed

Incorporation papers have been taken out for the establishment of the Nitro Fertilizer and Equipment Co., Inc., in Salina, Kansas. Incorporators are G. M. McClellan and Bernard W. Knowles, both of Salina and C. R. Hubbard, of Beloit, Kansas.

Top-grade bagging materials plus expert designing and careful construction, give V-C Multiwall Bags the ability to stand rough, tough treatment in handling, in shipping and in storage.

Better-built V-C Multiwall Bags are made and attractively printed to your specifications in the following styles: sewn open mouth, sewn valve, sewn valve with sleeve or with tuck-in sleeve, pasted open mouth, and pasted valve.

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MULTIWALL BAGS
2 TO 6 PLY
Plain or printed in 1 to 4 colors

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Technical BRIEFS

Sycamore Blight Control

by Dr. E. R. deOng, Albany, Calif.

SYCAMORE blight or anthracnose is a common disease of the sycamore but until recently only little attention had been given to its control. The disease, caused by a fungus (*Gnomonia veneta*), kills many of the leaves and results in dieback and cankers on the young twigs. It is particularly severe in its attack on native species and to a less extent on the introduced species, *Platanus orientalis*. It is a common sight in California to see the sycamores growing along the creeks, practically denuded of leaves by midsummer.

Experiments on the control of this disease were made on the campus of Mills College, Oakland, California, in the spring of 1953. The location chosen offered a severe test of control measures, as heavy fogs prevail in the spring and summer and late spring showers are common. The trees are planted about 20 feet apart in a double row on each side of a campus driveway. They have grown unchecked, resulting in dense heads and interlocking limbs. Height is about 25 feet.

Since crowding was a contributing cause to the progress of the disease, the first step was to prune 12 trees. This group was then divided among the three spray plots with unpruned trees to be added as desired. Previous experiments, as shown in the literature, reveal the value of certain of the mercurial fungicides as a control of the disease. The application by a power sprayer of such compounds on a college campus would, however, be subject to criticism so it was decided to use one of the thiocarbamates. Dithane D-14 (nabam,—disodium ethylene bisdithiocarbamate) was supplied by the Rohm & Haas Company with the recommendation that this be combined in the spray tank with ferric sulfate and zinc sulfate. The tank mix of Dithane D-14 with the mixed sulfates has been found superior for controlling some diseases to Dithane Z-78 (zineb), a dry, one package zinc Dithane compound. The formula was Dithane D-14—one half gallon, five ounces of technical ferric sulfate and 10 ounces of zinc sulfate (22.8% metallic) to 100 gallons of water. The ferric and zinc compounds are first dissolved in the tank and the Dithane added with the agitator running. The same formula was used on all of the blocks, the variation being alone in the timing of the applications.

First application, trees dormant, March 17, 1953.

Second application, opening leaf buds 1 inch long, April 4.

Third application, leaves one half mature, May 4.

Fourth application, leaves mature, May 25.

First application was made on 4 pruned trees and several unpruned ones. The sprayed but unpruned trees leafed out somewhat better than the unsprayed and unpruned trees. The sprayed and pruned trees had less blight than the pruned but unsprayed trees, but all the trees show blight attack.

Second application was made on 2 pruned trees. These trees were free from blight on June 13, except on buds unopened at the time of spraying.

Third application was made to 2 pruned trees. Infection was showing at the time of application but apparently there has been no new infection since then.

Fourth application was made to 4 pruned trees and 2 unpruned trees. A light infection shows throughout all 6 trees, so general that it is difficult to determine if any benefit resulted from the application.

The results are similar to those obtained by the Illinois station* particularly in the timing. In these experiments, mercury compounds gave the best results, but Dithane Z-78 was next in efficiency. Results appear similar under both midwestern and western conditions, timing being the important factor. One application as the leaf buds open gives practical control, but two sprays at 10 or 15 days intervals are preferable. Tank mixtures, such as used in the above formula, are now proving superior to the prepared zinc compound, — Dithane Z-78 in a number of instances. To simplify preparation, some distributors are now beginning to market a mixture of the two sulfates for use in the tank mixture.

*Hoffman, P. F., Plant Disease Reporter, 37(2):112 (1968).

•

Black Stem on Alfalfa

Greenhouse tests in Minnesota demonstrated conclusively that *Ascochyta imperfecta* can virtually eliminate production of seed if alfalfa plants are inoculated during the fruiting stage. Evidence obtained from comparing severely infected and slightly infected fields showed that black stem also reduced yields in the field.

Black stem apparently cannot be controlled at this time by the use of chemical sprays and dusts, but several cultural practices are suggested. Crop rotation will reduce disease because it takes at least two seasons to build up enough inoculum for a severe epidemic. Burning and cultivating fields early in the spring to eliminate overwintering inoculum tend to delay the development of epidemics. The latter two methods

however, are not recommended because burning is dangerous and destroys much organic matter. Cultivation wounds the crowns and roots of plants and increases the incidence of crown and root rot, thus reducing stands.

The use of resistant varieties appears to be the only practical means of control, but at the present time there are no resistant varieties. Recently, however, resistant clones of alfalfa have been found. These may be incorporated into a program of breeding for resistance to *Asochyta imperfecta*. M. F. Kernkamp and G. A. Hemerick *Phytopathology* 43, No. 7, 378-383, 1953.

•

Brown Rust Control

Several sulfur containing materials were studied with respect to effectiveness in control of brown rust in wheat. The following compounds are listed in order of decreasing effectiveness: 1% calcium polysulfide; .1% colloidal sulfur; .1% Duphar; and .5%, 1%, and 2% Bordeau mixture. Fosferno "20" and lead arsenate were ineffective. *Zashtita Bilja* No. 12, 43-8 (1952).

•

CBP for Nutgrass

Preliminary field trials showed that 80 gallons of 55% CBP (chlorobromopropene) formulation per acre, injected eight inches deep with a weed gun, will give effective nutgrass control on well tilled soils of moderate moisture. Studies were conducted by B. E. Day of the University of Calif. Citrus Experiment Station. *Science News Letter*, August 1, 1953.

•

Calcium Deficiency in Corn

Field corn showing typical calcium deficiency symptoms contained less than .2 per cent calcium in the plant as a whole. The pH of the soils was less than 4.5 and the exchangeable calcium was less than 2 milliequivs per 100 g. of soil. The deficiency was brought about by the addition of large amounts of nitrogen, phosphorus and potassium fertilizers to acid soils without correcting the acidity. S. W. Melsted *Soil Science Soc. Am. Proc.* 17, 52-4 (1953).

Outlook on Fly Resistance to Insecticides

FLY resistance to insecticides is still a significant problem in dairy barns, dwellings, poultry houses, packing establishments, etc. Agricultural experiment stations throughout the country have continued studies on DDT and other insecticide resistance throughout the past 10 years, and renewed interest has developed in the problem due to the recent report by Drs. R. B. March, R. L. Metcalf and L. L. Lewallen, University of California, Riverside, presented at the meeting of the Pacific coast branch of E.S.A. this past June. Dr. March reported that flies were losing their resistance in the field to DDT and lindane for the first time in California, and indicated the future outlook appeared hopeful.

In view of these findings, *Agricultural Chemicals* has contacted investigators around the country to compare results on this study, and will report them in succeeding issues of this publication. The first such report follows, and presents the status of fly resistance to chemicals in Illinois, as found by Dr. G. C. Decker and W. N. Bruce, Illinois Natural History Survey, Urbana, Illinois.

Fly Studies in Illinois

It is still too early to predict with any degree of certainty whether house fly resistance to chemicals will increase, reach and maintain an as yet unpredictable level, or reverse present trends and ultimately show a gradual decline. Annual surveys to determine the status of house fly resistance to DDT conducted over a period of 8 years tend to show that in Illinois resistance to DDT is still increasing despite a very considerable decrease in the use of DDT for fly control.

In 1952 a study of 83 samples of flies collected at random and for the most part from farms scattered over the state of Illinois indicated a slight gain in tolerance for DDT over that observed in 1951. It appears possible, however, that we may be reaching a peak, as the increase in tolerance was not at all commensurate with that observed in previous years. There are still many farms and no doubt some communities in which the degree of resistance attained is relatively low and conditions of sampling rather than actual variations in the fly populations may easily account for observed variations in the minimum LD-50 values encountered. Therefore, the values for maximum and average LD-50 values may have greater significance.

Further study with the same 83 field-collected strains of flies showed an apparent decrease in fly tolerance for lindane and methoxychlor amounting to about 50 percent of the values obtained in the 1951 survey. Lindane tolerance dropped from 2.54 μg. per fly in 1951 to 1.04 μg. per fly in 1952. Methoxychlor tolerance likewise dropped from 36.6 μg. per fly in 1951 to 17.67 μg. in 1952. The reasons for this apparent loss of tolerance are not clear. It may represent an actual loss in tolerance, but it may be largely attributable to sampling procedures as there were many more farms on which methoxychlor and lindane had been used extensively and for some time in the 1951 survey than there were in 1952.

Laboratory studies continue to indicate that strains of flies that have acquired varying degrees of resistance to DDT will maintain their level of resistance unchanged indefinitely, even when unexposed to DDT in any way, if no outbreeding is permitted and randomization of eggs from all components of the strain is attained at each generation.

On a number of experimental farms not included in the surveys, where a very high degree of resistance to DDT had been developed through the intensive use of DDT over a period of years, an apparent gradual loss of resistance developed when DDT treatments were discontinued, but this may be attributable to an infiltration of flies from outside

sources and resulting outbreeding of resistance in these very local areas.

The future of house fly and for that matter insect resistance to chemicals is by no means clear. There is little justification for undue pessimism but likewise there is certainly no immediate cause for unrestrained optimism.

•

Insecticides Pollute Streams

Streams can be made toxic to fish by drainage from fields treated with the insecticide toxaphene, according to studies by Drs. P. Doudoroff, M. Katz and C. M. Tarzwell at the U. S. Public Health Service Environmental Health Center in Cincinnati. They report that toxaphene washed into the streams with soil is not made harmless by adsorption on the soil particles, nor is it effectively settled out of the water by sedimentation.

In a series of tests in which different insecticide powders were added directly to aquarium water, toxaphene was found to be most toxic to fish, with aldrin next. DDT and BHC were much less toxic in these tests. *Sewage and Industrial Wastes*, July, 1953.

2 Phosphate Toxicants Show Systemic Action

HIGH systemic activity, and moderate to high contact activity are claimed by Shell Chemical Corp.'s researchers Corey, Dorman, Hall, Glover and Whetstone for the new phosphorus compounds, diethyl 2-chlorovinyl phosphate (Compound 1836) and dimethyl 1-carbo methoxy-1-propen-2-yl phosphate (Compound 2046). Both compounds, which were developed at Shell Agricultural Laboratories, Modesto, Calif., were previously shown to be effective insecticides and acaracides. Further evaluation studies are now in progress at Shell's Denver laboratories and several other stations.

Toxicological studies for both compounds show that there is no increase in toxicity for a given dosage with increased exposures . . . these compounds are therefore thought to move out of the plants in the transpiration stream, as is the case with bis (dimethylamino) fluorophosphine oxide. The rate of loss and length of time that the materials remain in the plants in effective amounts are thought to be a function of their volatility. Comparison with known materials shows that while the toxicity of systox is retained for at least 72 hours, Compound 1836 loses its effectiveness after 24 hours, and the toxicity of Compound 2046 is significantly reduced in this period.

Tests comparing dosages of .1, 1.0, and .5 per cent of the new phosphate compounds showed definite dosage responses with the same relative rates of toxicity loss at both the higher and lower dosages. Root absorption studies, using a pinto bean plant infested with two spotted mites, showed an LD_{50} of .75 ppm for the organic phosphates, and LD_{50}'s of 1.5 ppm and 25 ppm respectively for Systox[1] and OMPA[2].

In a review of systemic insecticides, E. E. Ivy[3] USDA, College Station, Texas, points out that both Compound 1836 and Compound 2046 are more effective than schraden against cotton aphids, as shown by nutrient solution and seed treatment tests. He indicated also that the phosphates exhibited systemic toxicity to chewing insects but were more phytotoxic than schraden and some of the other compounds.

Studies at Shell[4] indicate that part of the systemic action of the organo phosphate compounds may be due to escaping vapors of translocated chemical, exerting fumigation effects; action of this type would not be limited to insects feeding on the treated plants. Additional data indicate these compounds might make good space fumigants, better grain fumigants than chloropicrin and methyl bromide.

Commercial significance centers on the high volatility and thus low residual toxicity, leading perhaps to new fields of application for phosphorus systemics. It is emphasized that these two new materials are still definitely in the testing stage. There is no indication when the product may go into commercial production, or even whether it will eventually be made available commercially. As a matter of fact, at the present time, even small test amounts are not generally available.

Physical Properties and Preliminary Mammalian Toxicities

Name	Compound 2046	Compound 1836
Structure	Diethyl 2-chlorovinyl phosphate $(C_2H_5O)_2P(O)OCH=CHCl$	Dimethyl 1-carbomethoxy-1-propen-2-yl phosphate $(CH_3O)_2P(O)OC(CH_3)=CHCOOCH_3$
Physical State	Colorless liquid	Light yellow-green liquid
Distillation Range	116° C. at 10 mm.	106-107.5° C. at 1 mm.
Evaporation Rate, per cent per hour from glass plates at room temperature	38	3
Stability of diluted emulsible concentrate, measured by bioassay	>7 days	>7 days
Water solubility	Approx. 1%	Miscible
Mammalian toxicity,[1] acute oral LD-50, mg. kg.		
Mice	30.5	8.9
Rats	7.4	4.0
Human red blood cell cholinesterase inhibition,[2] ID-50	$1.7X10^{-5}M.$	$2.3X10^{-5}M.$

[1] diethyl 2-mercaptoethyl thionophosphate, Chemagro Corp., New York.
[2] octamethylpyrophosphoramide, Monsanto Chemical Co., St. Louis, Mo.
[3] E. E. Ivy, *Agricultural Chemicals* April, 1953, pp. 47-50, 137, 1939.
[4] R. A. Corey, S. C. Dorman, W. E. Hall, L. C. Glover, *J. Economic Entomology*, April 1953, pp 386-387.

•

Soil Erosion Control

The application of hydrolyzed polyacrylonitrile to the soil at rates of one-half to one pound per 100 square feet stabilizes the soil, reducing runoff on slopes. Soil erosion can thus be controlled until vegetation is established. Results with the soil condition-

ers were comparable to those obtained with straw mulch. L. E. Weeks and W. G. Colter *Soil Science* 73, 473-84 (1952) through *Chemical Abstracts*.

•

Dalapon for Grass Control

The Dow Chemical Co., Midland, Mich., announced recently the development of a new chemical, Dalapon, which shows promise as a grass control agent. The material is currently being tested by state colleges and federal and state agricultural experiment stations. A report on the findings may be announced at the National Weed Control Conference in Kansas City in December.

•

MH-40 for Food Storage

A new use for U. S. Rubber's maleic hydrazide has recently been approved by the USDA. A forty per cent mixture known as MH-40 is effective in preventing onions and potatoes from sprouting in storage. The U. S. Rubber Co. claims that as much as a year can be added to storage life of potatoes by this treatment.

The chemical is sprayed on onion and potato leaves several weeks before harvesting. MH-40 is absorbed by the leaves, and works its way down to the bulb. It stops sprouting by preventing further cell division within the bulb.

U. S. Rubber estimates the cost of spraying an average field with MH-40 at between $14 and $19.

•

NEW BOOKS

Chemical Control of Insects by T. F. West, J. E. Hardy, and J. H. Ford. Published by John Wiley & Sons, Inc. 212 pages, 5½ x 7½ inches, cloth binding, price $3.25.

This text presents a general overall picture of insecticides, attempting to cover both the household and agricultural field in a very few pages. It reduces the amount of space devoted to this field further by covering the additional field of attractants and repellents.

The various chapters include a general discussion of insects, an outline of pest control, fumigation, nicotine, rotenone and related compounds, petroleum oils, coal tar derivatives, miscellaneous insecticides, soil insecticides, pyrethrum, lethane and thanite, chlorinated persistent insecticides, weed control, repellents and attractants.

The text is compact, easy to read, and provides a reasonable overall picture of insect control.

Plant Growth Substances—by L. J. Audus. Published by Leonard Hill Ltd., London, England. 466 pages, 6 x 9 inches, cloth binding.

The nature of plant growth and its control, considering the various factors involved and the effect of plant hormones in this respect is considered in detail in this text. A review of the auxins, . . . synthetic and natural . . . their use as general growth stimulants, their use in grafting and wound healing, also as growth inhibitors, is considered in several chapters of the book. Still another valuable chapter deals with growth substances in the soil.

NITROGEN

(*Continued from Page 53*)

product. Breakdown by individual plants is considered confidential and available. Through these figures it can be seen that the increased production of solid N will be principally in the form of such concentrated materials as ammonium nitrate, urea and nitrophosphate products.

Probable Outlook

THIS expansion has to take care of an ever-increasing military and industrial demand which is expected to exceed 700,000 tons by 1955. The military alone is expected to take between 180,000 and 190,000 tons of N annually as anhydrous. The total of these estimated requirements results in the expansion goal for 1955 to be 2,930,000 tons of N.

If projected to 1956, nitrogen requirements would indicate a demand of over 3,250,000 tons of N annually. In other words, a potential shortage of over 300,000 tons of N

(*Turn to Page 149*)

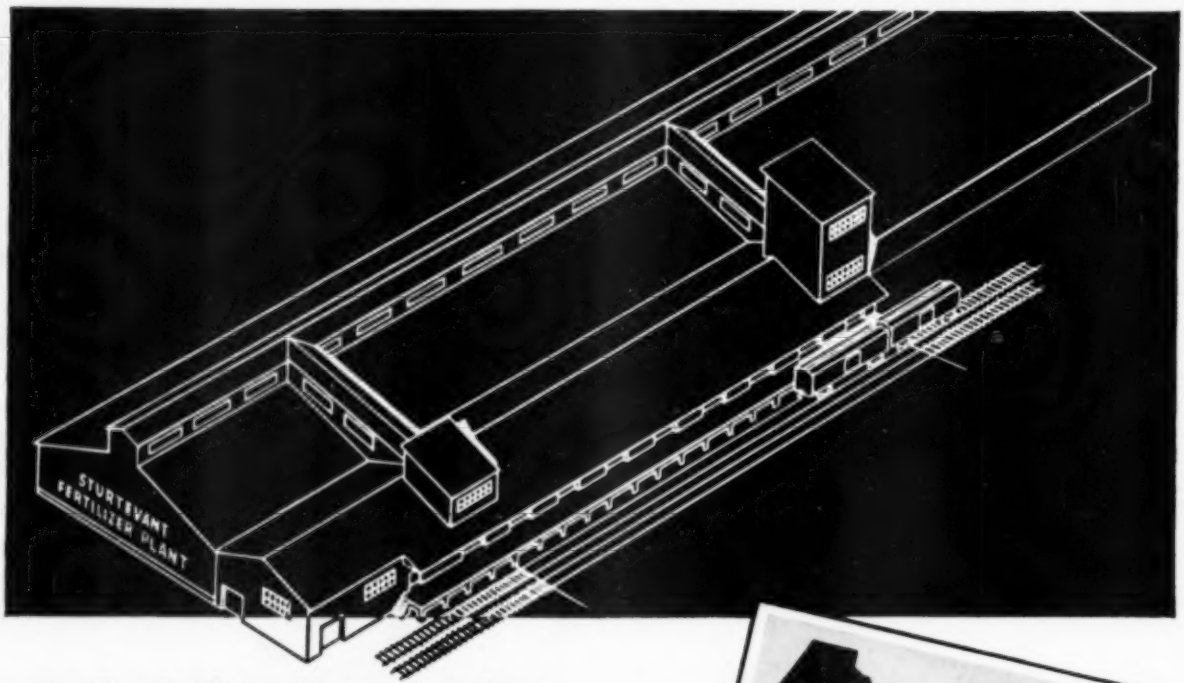
TABLE 8

List of Certified Solid Nitrogen Facilities By Products

	Company	Location	Capacity in Net Tons N.
UREA	Allied Chem. & Dye	South Point, Ohio	
	Allied Chem. & Dye	La Platte, Neb.	
	American Cyanamid	New Orleans, La.	
	American Cyanamid	New Orleans, La.	
	Deere & Co.	Pryor, Okla.	
	Delta Chem. Co.	Buras, La.	
	Grace Chem. Co.	Memphis, Tenn.	
	Pacific Chem. Co.	Pasco, Wash.	Total — 216,400
AMMONIUM NITRATE	Commercial Solvents	Sterlington, La. — Aug. 1, '53	
	Coop. Farm Chem.	Lawrence, Kans	
	Lion Oil Co.	Luling, La. — Fall '54	
	Mississippi Chem. Co.	Yazoo City, Miss. — Spring '54	
	Mississippi Chem. Co.	Yazoo City, Miss. — Spring '54	
	Gulf Improvement Co.	Pascagoula, Miss.	
	Phillips Chem. Co.	Etter, Tex.	
	Allied Chem. & Dye	La Platte, Neb.	Total — 223,000
AMMONIUM SULPHATE	Allied Chem. & Dye	Hopewell, Va.	
	American Cyanamid	New Orleans, La.	
	Filtrol Corp.	Vernon, Calif.	
	Phillips Chem. Co.	Pasadena, Tex.	
	Rohm & Haas	Bristol, Pa.	
	Rohm & Haas	Bristol, Pa.	
	Mathieson Chem. Co.	St. Louis, Mo.	
	Thurston Chem.	Joplin, Mo.	Total — 89,800
AMMONIUM PHOSPHATE	Mathieson Chem. Co.	St. Louis, Mo.	
	Mathieson Chem. Co.	Pasadena, Tex.	
	American Zinc Co.	Dumas, Tex.	
	Best Fertilizer Co.	Lathrop, Calif.	
	Missouri Farm Assn.	Galena, Kans.	
	Simplot Fert. Co.	Pocatello, Idaho	92,200
PHOSPHATE	Allied Chem. & Dye	La Platte, Neb.	
	Allied Chem. & Dye	South Point, Ohio	
	Northern Chem. Inc.	Sandy Point, Maine	
	E. Rauh & Sons	Tuscola, Ill.	
	Gulf Improvement Co.	Pascagoula, Miss.	
	Southeastern Chem. Co.	Lemont City, Ill.	
	Thurston Chem. Co.	Joplin, Mo.	
	International Mineral and Chem. Co.	Tuscola, Ill.	Total — 132,000
			Grand Totals — 753,700

LARGE OR SMALL

STURTEVANT builds them all...



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INDUSTRY *Patents*

The information below is furnished by patent law offices of

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402 Bowen Building
Washington 5, D. C.

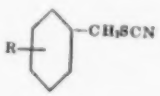
The data listed below is only a brief review of recently issued pertinent patents obtained by various U. S. Patent office registered attorneys for manufacturers and/or inventors. Complete copies may be obtained direct from Lancaster, Allwine & Rommell by sending 50c for each copy desired. $1.00 for Canada. They will be pleased to give you free preliminary patent advice.

2,642,351. CONTROL OF AQUATIC PLANTS. Patent issued June 16, to Arthur W. Swezey, Garden Grove, Calif., assignor to the Dow Chemical Co., Midland, Mich. A method for controlling aquatic plants which includes the step of introducing into the water adjacent to the submersed portions of the plants a water-dispersible concentrate comprising as a toxic ingredient the delta isomer of 1,2,3,-4,5,6-hexachlorocyclohexane.

2,642,352. CONTROL OF AQUATIC WEEDS. Patent issued June 16, to Arthur W. Swezey, Garden Grove, Calif., assignor to the Dow Chemical Co., Midland, Mich. A method for controlling aquatic plants which includes the step of introducing into the water adjacent to the submersed portions of the plants a water-dispersible concentrate comprising as a toxic ingredient 1,1,2,3,4,5,6-heptachorocyclohexane.

2,642,354. METHOD AND COMPOSITION FOR THE CONTROL OF UNDESIRED VEGETATION. Patent issued June 16 to Keith C. Barrons, Midland, Michigan, assignor to the Dow Chemical Co., Midland, Mich. A method for the control of undesired plant growth which comprises contacting plants and plant parts with a compound selected from the group consisting of α,α-dichloropropionic acid and its salts, such compound being employed at a dosage exerting a phytotoxic action against the plant growth concerned.

2,642,353. ORGANIC THIOCYANATE HERBICIDES. Patent issued June 16, to David T. Mowry and Arthur H. Schlesinger, Dayton, Ohio, assignors to Monsanto Chemical Co., St. Louis, Mo. The method of destroying undesired plants which comprises applying to said plants a toxic quantity of a herbicidal composition comprising an inert carrier and as the essential active ingredient an organic thiocyanate having the formula

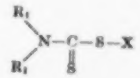


in which R is an alkyl radical of from 3 to 9 carbon atoms.

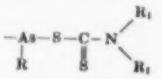
2,642,355. PRODUCTION OF CONCENTRATED FERTILIZER BY BASE EXCHANGE. Patent issued June 16, to Robert D. Pike, Greenwich, Conn. The process for making fertilizers by base exchange between the potassium of Wyomingite and the sodium of a solution of a sodium salt of a plant food acid of the group consisting of sodium nitrate and sodium phosphate, whereby a potassium salt of the same acid is formed, which comprises flowing said solution progressively upwardly through substantially fixed beds of fragmented Wyomingite of increased potassium content positioned in a series of pressure retaining vessels maintained at elevated pressures to effect base exchange therein until a finished solution is obtained containing a potassium salt and a sodium salt of the plant food acid in which the potassium content exceeds the sodium content by at least 5 to 1, progressively discarding the spent Wyomingite residue from the vessel containing Wyomingite with the least potassium content, and running the finished liquor to dryness to produce a fertilizer.

2,643,965. NEW CHEMICALS AND FUNGICIDAL COMPOSITIONS CONTAINING SAME. Patent issued June 30, to George E. O'Brien, New Haven; Adelaide Bornmann, Bethany, and Allen E. Smith, Oxford, Conn., assignors to United States Rubber Co., New York. A chemical selected from the group consisting of N-(p-chlorophenyl)-o-nitrobenzamide and N-methyl, N-(p-chlorophenyl)-o-nitrobenzamide.

2,644,005. ORGANIC ARSENICAL COMPOUNDS. Patent issued June 30, to Ewald Urbschat, Kiln-Mulheim, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany. Organic arsenical compounds of the general formula:

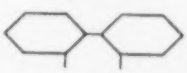


wherein X stands for a radical selected from the group consisting of:



and

R_1 stands for a radical of the group consisting of hydrogen, alkyl, aryl, aralkyl, tetramethylene, pentamethylene and — $CH_2CH_2O.CH_2CH_2$ — both free valences of these divalent radicals being attached to the nitrogen atom, and R stands for a radical of the group consisting of alkyl, aryl, aralkyl and



both free valences of this latter radical being attached to the arsenic atom.

2,640,772. PLANT FERTILIZER. Patent issued June 2, 1953, to John Morris Arthur, Yonkers, N. Y., assignor to Boyce Thompson Institute for Plant Research, Inc. A composition of matter for the growing of plants which comprises as a major active constituent from 1/10 to ½ part by volume of an organic nitrogen-bearing material of the group consisting of wool, hair and feather in admixture with not more than 3% by volume of undigested carbohydrate material of plant origin, a relatively small proportion of an inorganic nitrate which releases nitrogen rapidly to serve as a starter for a young plant, and an inorganic phosphate, said composition being so balanced between carbohydrate and organic nitrogen content that it furnishes during its decomposition a steady supply of nitrogen for growing plants in small containers without injury due to excess soluble nitrogen and at the same time increases the fixation of atmospheric nitrogen by micro-organisms when mixed with neutral soil.

2,640,800. TETRAETHYL PYROPHOSPHATE INSECTICIDE. Patent issued June 2, 1953, to David L. Shatto, Riverside, Calif., assignor to California Spray-Chemical Corp., Richmond. An insecticidal dust composition comprising tetraethyl pyro-

phosphate and anhydrous calcium sulfate as a stabilizer therefor.

2,641,563. INSECTICIDAL AND ACARICIDAL COMPOSITION COMPRISING PROPYLENE GLYCOL AND ALKALI AMMONIUM SULFO SULFIDE. Patent issued June 9, to Joseph B. Moore, Edina, Minn., assignor to McLaughlin Gormley King Co., Minneapolis, Minn. A water miscible spray composition for agricultural spraying purposes comprising propylene glycol and alkali ammonium sulfo sulfide.

2,643,948. METHOD OF PRODUCING A FERTILIZER FROM PHOSPHATE ROCK. Patent issued June 30, to Maurice Sourdet, Paris, France, assignor to Societe d'Etudes Chimiques Pour l'Industrie et l'Agriculture, Paris, France. Method of treating natural phosphates for the production of phosphate fertilizers, which comprises heating the natural phosphate in a temperature range of 1100° C. to 1200° C. with an alkali metal salt to obtain a double calcium and alkali metal phosphate, hydrolyzing the said double phosphate to obtain a calcium phosphate fertilizer having high solubility in citric acid solutions, and a concentrated alkaline solution, and recovering the content of the alkali metal compound present in said alkaline solution.

2,643,796. APPARATUS FOR DISTRIBUTING FERTILIZER OR THE LIKE. Patent issued June 30, to August W. Gustafson, Corpus Christi, Texas. An apparatus for discharging pulverulent material, a rotatable drum, a stationary feed barrel within and extending along the axis of the drum, a flexible sleeve within said barrel, said barrel and sleeve having an aperture therein through which the pulverulent material may pass to the interior of the sleeve, means for distorting said sleeve inwardly, and a flexible feed member within the sleeve for moving the pulverulent material axially within the sleeve.

TRADE MARK APPLICATIONS

ALASKA FISH FERTILIZER, with the word "Alaska" printed vertically, for fertilizer materials. Filed July 1, 1952, by E. J. Wolf, doing business as Alaska Fertilizer Co., Seattle, Washington. Claims use since on or about June 1, 1949.

GREEN KEEPER, in hand-lettered caps and lower case, for enriched organic plant food. Filed May 24, 1951, by Davies Nitrate Co., Inc., New York. Claims use since May, 1950.

TNT, in heavy capital letters, for fertilizer. Filed Dec. 18, 1952, by Stadler Fertilizer Co., Cleveland, Ohio. Claims use since Nov. 7, 1952.

MR. N., in script letters, for am-

monium nitrate fertilizer in the form of prills. Filed Apr. 23, 1952, by Spencer Chemical Co., Kansas City, Mo. Claims use since April 2, 1952.

MR. N, in script, imprinted over drawing of corn leaves in shape of a man, for ammonium nitrate fertilizers in the form of prills. Filed May 5, 1952, by Spencer Chemical Co., Kansas City, Mo. Claims use since Apr. 2, 1952.

GARDEN MARVEL, in hand-lettered capitals, for fertilizers. Filed Oct. 29, 1952, by Joseph D. Slater, doing business as Plant Marvel Laboratories, Chicago. Claims use since May 12, 1946.

GRO-COAT, in capital letters, for plant hormones combined with seed disinfectants and protectants. Filed Mar. 8, 1952, by Berry Seed Co., also doing business under the names Griswold Seed Co.; Mid-Continent Seeds, Inc.; Standard Seed & Feed Co.; Standard Seed Co.; and American Field Seed Co., Clarinda, Iowa. Claims use since Nov. 19, 1950.

DIXSOL, in hand-lettered capitals, for nitrogen solutions used as or in the production of soil fertilizers. Filed Apr. 11, 1952, by Commercial Solvents Corp., New York. Claims use since Oct. 5, 1951.

BLACKLAND BOOSTER, with the first word in hand-lettered type, for plant food for use as a fertilizer. Filed Mar. 26, 1951, by Hi-Yield Fertilizer Co., Bonham, Tex. Claims use since Feb. 19, 1951.

SPEAR AND SHIELD, drawing inside circle, for bone meal and dehydrated poultry and cow manure for use as fertilizers. Filed Oct. 27, 1952, by Howard Wong, doing business as European Coast Chemical House, New York. Claims use since Sept. 7, 1951.

SPUD, in thin capital letters, for insecticide. Filed Dec. 7, 1950, by Geigy Co., Inc., New York. Claims use since Apr. 27, 1948.

HO-NO-MO, in stencil capital letters, for weed killer. Filed Nov. 17, 1952, by Spencer Chemical Co., Kansas City, Mo. Claims use since Oct. 30, 1952.

WARFICIDE, in Stymie capital letters, for rodenticide. Filed Apr. 24, 1952, by the D-Con Company, Inc., Chicago. Claims use since Apr. 9, 1952.

EDUCATION

(*Continued from Page 35*)

dealer, and others. Strongly-worded competitive claims may sell one product temporarily, but in the long run they only serve to undermine public confidence in the entire family of agricultural chemicals. We must still sell the *idea*.

Now, how shall we sell the idea of using agricultural chemicals? It is up to our ingenuity. Considerable material exists, and more is being created all the time. The Federal and State services, the universities and agricultural colleges, the independent scientists, join with industry's research teams to issue practical, impartial, and specific information. They disseminate this information as best they can. The NAC Association gives it wider distribution. Yet, in the last analysis, it remains for the individual members of the industry to see that this material is picked up, translated into concise reports, and circulated through all the modern techniques of publicity, advertising, and merchandising, to the farmer. For the farmer is not a hard man to sell; like everyone else, he doesn't want to spend his money foolishly. He'll buy, when he sees why.

They tell the story of the farmer who sent his son to Agricultural College. When he was back home, he told his father that the hogs would eat in half the time if they

had a longer, wider trough. "Son," said the farmer, "That may be true—but what's time to a hog?" Now, if the son had explained that they would get fatter hogs, and thus more money, the *idea* would have been accepted. So it is with agricultural chemicals. Let's get together and sell the *idea*.

•

Mgr. For Equipment Co.

JOHN MILLER

Highway Equipment Company, Inc., Cedar Rapids, Iowa, has announced the appointment of John Miller as new southeastern district manager for the company with headquarters in Atlanta, Georgia. Included in that territory are the states of Arkansas, Louisiana, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama and Mississippi.

Mr. Miller is a registered Engineer in the state of Georgia and prior to coming with Highway Equipment, was with General Machinery Corporation of Atlanta. Before that, he was with Harnischfeger Corporation in a southern territory.

Highway Equipment Company, Inc. manufactures a complete line of spreaders and bulk delivery equipment.

•

L. A. Hits Fertilizer Snag

The Los Angeles City Council has given up its earlier hopes of realizing a profit of some $700,000 a year from its Hyperion sewage treatment plant, according to the *Los Angeles Times*. Not only will there be no profit from the sale of fertilizer from the plant, but the city faces further losses in its pelletizing plant which ran into difficulty because of the presence of certain abrasives in the sewage being processed.

According to the *Times*, the Council members were brought face-to-face with the situation when the city's contract with Kenneth S. Kritzer was cancelled. Mr. Kritzer, it developed, had contracted with others, to purchase city-manufactured fertilizer at $8.46 a ton.

Along with the cancellation of the contract, came a report from the City Administrative Officer, Samuel Leask, Jr., advising that since the $464,288 pelletizing plant had been built, discovery had been made of the abrasive situation which was bringing the per ton production cost up to more than the Kritzer bid. This meant, of course, that if more fertilizer were made to sell for $8.42,

it would be sold at a substantial loss.

According to Mr. Leask, pelletizing knives costing approximately $25,000 will be a total loss, but he added that there may be some salvage of other equipment.

Later, representatives of the City Engineer's office will discuss with the Council reasons why the pelletizing program was entered before all of the potential complications had been explored fully.

Originally, the Hyperion fertilizer was sold to another company in an unpelletized, dry condition at a lower cost per ton. Consideration is now being given to resuming this practice or to finding an alternative method of concentrating the product.

•

APS Meeting in Wisconsin

Plans were complete, at press time, for the forty-fifth annual meeting of the American Phytopathological Society at the University of Wisconsin, Madison, September 7-10. The meeting was planned in connection with the meeting of the American Institute of Biological Sciences.

One of the most important events of the APS meeting each year is the Fungicide Colloquium, scheduled for the evening of September 7. In this session, representatives of industry are given opportunity to present information on new products to be available for next year's growing season or for use in experiments.

Dr. S.E.A. McCallan, Boyce Thompson Institute for Plant Research, Yonkers, N. Y., secretary of the Society, announced details of the program earlier, indicating that a session on fungicides was to be included in the meeting program. Part of the program for this portion included the following: Gordon S. Taylor, Connecticut Agri. Station, "Control of Tobacco Blue Mold by Root Application of Zineb and Ferbam"; J. D. Wilson and J. B. Miller, Ohio Station, "Polyelectrolytes as Soil Conditioners"; and Curt Leben, U. of Wisconsin, "Acidic Buffer Sprays and the Control of Early Blight on Tomato Leaves."

Four authors, A. G. Newhall, W. A. Rawlins, J. L. Brann, Jr. and

W. W. Gunkel have prepared a paper, "Liquid Concentrates versus Dusts for In-the-Row Treatments Against Seedling Diseases and Insect Pests, with Special Reference to Onion Smut and Maggot," for presentation at the meeting. Another paper, by James G. Horsfall and Saul Rich, Connecticut Station, New Haven, was to be presented. It is entitled, "Relation of Polyphenol Oxidases to Fungitoxicity."

H. L. Keil, H. P. Frochlich and Frank B. Maughan, Rohm & Haas Co., Philadelphia were to present a paper, "Efficacy of Certain Organic Compounds in Control of Bean Powdery Mildew under Laboratory Conditions," and another paper, "Comparisons of Fungicides for the Control of Strawberry Leaf Blight" by Robert H. Fulton and Donald Cation, Michigan State College, was to be presented.

Other sections of interest to the trade included symposia on virus diseases of tobacco and other plants; cereal diseases, diseases of vegetable crops and of forage crops, and diseases of ornamentals and turf.

The meeting was to terminate at noon Thursday, Sept. 10, following a session on plant diseases and a business meeting.

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Nitrogen Pioneer Dies at 86

One of the country's pioneer chemists in the synthetic nitrogen industry died August 17 at Hopewell, Va. He was William Schultze, 86, who for many years had been associated with the Hopewell plant of the Nitrogen Division, Allied Chemical & Dye Corp., before his retirement in 1946. Since that time, he had served as a consultant on patent and other technical matters for the Division.

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Offers Fungicidal Product

Naftone, Inc., New York, has been appointed by Bennett, Inc., Cambridge, Mass., as sole sales agent for Bennett's new line of fungicide-bactericides, marketed under the trade name of "C 8 Q".

According to the makers, the compounds are anionic emulsions of Copper 8-Quinolinolate, available at different concentrations over a wide pH range.

Samples and use information are available from Naftone, Inc., 515 Madison Ave., New York 22, N. Y.

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NFA Fall Program Under Way

Two speakers of national reputation are scheduled to appear on the program of the annual fall convention scheduled by the National Fertilizer Association at the Biltmore Hotel, Atlanta, Ga., from November 16-18.

Senator Richard Russell of Georgia and the U. S. Department of Agriculture's new Extension Service Director, Clarence M. Ferguson, are both expected to speak at the meeting.

The NFA indicates that advance reservations at the Biltmore indicate a greater registration than ever before at the fall meeting.

The Acid Test...

HOW many people really **read** a magazine? That's the acid test of advertising value. Not how many people receive the magazine, but how many actually read it, and how many of those who read it offer a potential market for the product the advertiser is trying to sell.

A publisher may dump thousands upon thousands of copies of his magazine into the post-office and they will be delivered to the alleged readers. But who knows how many are read and how many find their resting place in a handy waste basket?

There is a real yardstick, however, which tells the advertiser all about magazines which are members of the Audit Bureau of Circulations (ABC). AGRICULTURAL CHEMICALS is always happy to have advertisers examine its ABC statements closely. There is no guessing—no figures pulled out of the air — no asking the advertiser to take our word for it. The ABC report presents a factual story,—tells how many paid subscribers we have, how their subscriptions were obtained, what they paid and what their exact connection is with the agricultural chemical field.

By contrast, non-members of the ABC make up their own figures, and you have to take their unsupported word, if you care to, that the readers they claim to reach offer a market for your products. You take their word also as to how many of their readers actually want their magazine enough to pay for it,—and how many they just send it to, with no assurance that it will ever be read, or that it will mean anything to the reader if it should be read.

Now, understand we have been talking about **paid** or partly paid circulation magazines. Those magazines which are just sent out willy nilly in large numbers to lists of alleged readers, wholly unsolicited, unordered and free as the air are not even being considered here. Who knows what happens to them after they go in the mail,—that is, if they really go in the mail? We contend that there is and can be no "acid test" applicable to baloney.

If these free magazines have all the circulation they claim and people want and need the books so much, why don't the publishers sell them to the readers? Glib salesmen may try to answer this question, but the answers we have heard were strictly evasive sales gab. And pretty much the same goes for those "paid circulation" magazines which claim everything, but prove nothing. Neither can they pass a circulation test, acid or otherwise.

And, one final word about big circulations, — claimed or otherwise — and the necessary connection they have with advertising rates. The bigger the circulation claim, the higher the rate. But watch out for waste circulation, — diluted readership — skimmed milk added to the cream, — a bunch of readers who don't buy what you sell — but who are thrown in by the publisher to try to justify an unreasonably high advertising rate.

Apply the old ACID TEST! Don't pay a fancy rate to reach prospects you can't sell. And watch out for phony claims. Insist on proof of readership!

AGRICULTURAL CHEMICALS

175 5th Avenue

New York, N. Y.

When Massachusetts Meets in California

Photo by Chuck Starker

East-West get-together. At the recent meeting of the Pacific Branch of the Entomological Society of America, alumni of the University of Massachusetts assemble for a session of reminiscences at Lake Tahoe, Calif. Pictured above are: (front row, L to R) Wm. Baker, Division of Cereal and Forage Insects, U.S. D.A., Washington, D. C.; Mrs. Stanley Bailey; Mrs. A. J. Flebut; Mrs. G. F. MacLeod; Malcolm MacLeod; Mrs. A. C. Sessions and Mr. Sessions, California Spray Chemical Corp., Fresno, Calif.

Second row: Mr. MacLeod, Sunland Industries, Fresno, Calif.; Mr. Flebut, Niagara Chemical Division, Food Machinery & Chemical Corp., Richmond, Calif.; Stanley B. Freeborn, University of California, Davis, Calif.; James Beal, Forest Insect Division, U.S.D.A., Washington, D. C.; Mr. Bailey, University of Calif., Davis; and L. A. Carruth, University of Arizona, Tucson.

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New Haven Field Day

Investigations of the soils department were highlighted at a field day open to the public at the Connecticut Agricultural Experiment Station in New Haven on August 19. Of particular interest at the station to vegetable growers is a field trial of green manure crops being grown in rotation with lettuce and cabbage in a test series to retain soil value. Featured speaker of the day was Dr. Firman E. Bear, head of soils department at the N. J. Agricultural Experiment Station, New Brunswick, N. J., who reported on "Soil . . . the Substance of Things Hoped for".

The Connecticut soils department demonstrated a special cultivator, which it has designed, that is pulled by cables so that the tractor wheels never touch the trial field. The machine thus does not pack the soil, as do heavy tractor wheels, and may thus prevent deterioration of soil due to too much packing.

Other studies observed at the experiment station included soil conditioner test plots, corn planting methods under investigation, and several other soils experiments.

Fertilizer executives, foremen, others interested in achieving better safety record in the industry are urged to attend Chicago meeting, Hamilton Hotel, October 22.

Gallowhur Seeks Damages

Gallowhur Chemical Corp., New York, and Frank J. Sowa, have instituted civil action in the Superior Court of New Jersey, seeking $500,000 damages from Arthur Schwerdle, Paul A. Sartoretto, and W. A. Cleary Corporation, claiming the wrongful use of secret and confidential research data. These data are related in part to the solubilization and use of phenyl mercury compounds, and testing and application of organo mercury elements and compounds.

Gallowhur alleges that this research work was carried on by Mr. Sowa and the results and products obtained were trade secrets and were known to be such by the defendants.

The plaintiffs maintain that Mr. Sartoretto and Mr. Schwerdle obtained knowledge of these secret processes under confidential circumstances and wrongfully revealed them to the Cleary Corporation which in turn used the knowledge in manufacturing its product, "PMAS".

The suit demands judgment to stop the defendants from using these secret processes, and recovery of $500,000 damages to compensate the loss claimed to have been sustained by the plaintiffs.

SHADE TREE

(*Continued from Page 66*)

viewed by Mr. Haskell, indicated that "good results" were obtained on the gingko tree by applying maleic hydrazide at 750 ppm. in the full bloom stage. Fruit was greatly reduced in number and the only injury was a slight dwarfing effect.

Panel on Oak Wilt

WEDNESDAY morning's panel discussion of oak wilt was moderated by Dr. A. J. Riker, dept. of plant pathology, University of Wisconsin, Madison. Panel members were Dr. T. W. Bretz, div. of forest pathology, U.S.D.A., Columbia, Mo.; Dr. Wendell Bragonier, Iowa State College, Ames, Ia.; Dr. Rey D. Shenefelt, Univ. of Wisconsin; and Dr. R. B. Neiswander, Ohio Agricultural Experiment Station, Wooster, O.

Since first discovery of the oak

wilt disease in Wisconsin in 1942 and its later identification as of fungus origin, Dr. Riker said, it has now spread to 18 states, its most concentrated areas of incidence being in Illinois, Iowa, Wisconsin and Minnesota. Although it threatens the loss of millions of dollars of oak lumber, the situation is not hopeless, he asserted. He told of the recent organization of the National Oak Wilt Research Committee, sponsored by the oak lumber interests to coordinate research work on this tree disease. Shown, too, was a color film, produced by this research committee, which deals with the nature and control measure developed to date.

Under U.S.D.A. supervision, a nationwide survey is being made, Dr. Bretz said, to keep up with spread of oak wilt. Other members of the panel told of the work on appraisal of potential vectors of the causative fungus, including birds, squirrels, and insects, also "man and his tools," such as transcontinental gas pipe lines.

Pathology of infected trees is being investigated and fundamental studies are under way in the chemotherapy method of treatment. While conclusive proof is lacking, strong new evidence has been found, it was revealed, indicating the possibility that fruit flies, which swarm around spore masses, may play a part in the long distance transmission of the disease.

In the panel discussion of elm diseases, Dr. Curtis May, division of plant pathology, U.S.D.A., Beltsville, Md., announced that hybrid elms, resistant to Dutch elm disease and phloegm necrosis, the two chief diseases of this tree, have been developed, and may soon be made available to the commercial tree industry.

Dr. J. C. Carter, Illinois Natural History Survey, Urbana, Ill., was moderator of this panel, whose other members, in addition to Dr. May, were Dr. Donald L. Schuder, Purdue Univ., Lafayette, Ind., and W. N. Engledow, Midwestern Tree Experts, Indianapolis, Ind.

Protection against Dutch elm disease does not depend solely on development of resistant species, Dr. May cautioned. Sanitation, including removal of dead trees and limbs, and intensive use of sprays on insect vectors, must be continued, he declared. He cited some convincing figures indicating that spraying with DDT is less expensive than the cost of removing dead trees from public places after they become a safety hazard. If the disease spreads unchecked, he also said, the burden of removing dead trees will increase.

Other discussions centered on side effects of DDT on wild life, the problem of drift to sensitive plants, the buildup of mites, aphids and scale, and the spotting of parked motor cars.

Phloegm necrosis, the other elm disease, is spreading in Illinois, Dr. Carter reported. Formerly, it was confined largely to southern sections of that state, but new cases were quite recently discovered at Rockford, in northern Illinois. Despite the expense, Dr. Carter, insisted, spraying is very much worth while.

In the Urbana-Champaign area

during 1952, 555 elms were found infected with phloegm necrosis. If nothing is done about it, the disease might affect some 2,200 elms on the Univ. of Illinois campus.

In Indianapolis, elm disease is established, W. N. Engledow, stated. About 75 percent of our shade trees are elms, he pointed out, and this problem of controlling tree diseases must not be neglected.

Discussing spruce tree canker, Dr. Forest Strong, dept. of botany, Michigan State College, East Lansing, Mich., said no positive program has yet been developed for control of this comparatively new disease.

It is found occasionally on Norway spruce, he said, but its principal target is the Colorado blue spruce in the east central and lake states. Outstanding symptom is the dying of the branches, beginning at the tree's base and progressing upward. Death follows when the canker completely girdles the branch. He advised prompt removal and burning of affected branches, followed by application of fertilizer and water to promote the tree's general health and vitality.

Herbicides are beginning to play a large part in the line clearance problems of public utilities, Chas. E. Scott, executive of a Maywood, Ill., power company, stated, at a meeting of the National Arborist Association, held just prior to opening of the shade tree conference.

The chemical industry deserves credit for development of brush killing compounds, Mr. Scott declared. Their advent has provided a new tool for utility line clearance crews. While a complete kill cannot be expected, he said, the gain through use of herbicidal sprays warrants their use in greater volume.

Atlantic City was chosen as the site of the 1954 convention of the Shade Tree Conference. In 1955 Santa Barbara, Calif. has been agreed on, while, for 1956, the executive committee was instructed to explore the possibilities for a "floating convention" aboard a Great Lakes excursion boat cruising between Chicago and Buffalo, N. Y.

Letter to the Editor

THAT entomologists should not overlook other important phases of insect control while employing the various organic pesticides, is the thought behind a letter received from Dr. J. J. Davis, chief in Entomology, Purdue University, Lafayette, Ind. His communication is presented here in full:

"During the past ten or twelve years, since the advent of the new organic chemicals as insecticides, there has been an increasing tendency on the part of entomologists and users of insecticides to depend more and more on chemicals for insect control and to forget the more logical and practical procedures which we may include under the heading of preventive entomology. Preventive medicine, which is a major progressive step in the field of medicine, is on the increase. On the other hand, preventive entomology, recognized by early workers as a major factor in preventing losses, is losing its significance, but not its value, to a large extent.

"Perhaps the major reason for declining interest in such preventive measures as farm practices, sanitation and the like was the sensational results obtained in control with the new organic chemicals, the development of low pressure crop sprayers, and lower costs per acre. However, they are beginning to show and probably will continue to show their inadequacy through resistance which is being acquired by many insects to the chlorinated hydrocarbons."

We are beginning to realize that these new materials are not in themselves the solution to the insect problems; that insect control is not a simple matter as was supposed when DDT, chlordane, methoxychlor, and others first came into use; that we must return to the use of many of our old chemicals, especially the inorganic insecticides; and above all, we must renew our emphasis on practices, which are preventive, i. e., providing conditions unfavorable to insect development and which are, in general, good practices regardless of the insect, inexpensive, and take care of the problem before damage has been done.

"I do not wish to leave the impression that I oppose the use of chemicals and that they are not essential tools in insect control, because they are essential and will continue to be major factors in preventing insect losses. We must, however, recognize the fact that chemicals, in themselves, are not the solution to the insect problems and that we must re-emphasize preventive entomology along with insecticide practices.

"Another factor which has come into the picture is the development of insect tolerant and resistant varieties of plants and breeds of animals. But again we recognize the fact that they, in themselves, are not

solutions to insect problems and that these resistant entities may not be permanent factors and that too often they soon lose their resistant factors.

"My plea is that we must not depend on any one preventive or control but must use to the fullest extent chemicals, resistant varieties, natural enemies, mechanical measures, and above all the natural preventive practices already referred to."

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Potash Institute Reports Significant Gains in Deliveries of Material

POTASH deliveries in North America reached a record total of 1,945,630 tons K_2O during the fiscal year of June 1952 through May 1953, according to the American Potash Institute. This represents an increase of nearly 12% over 1951-1952, the Institute says. Deliveries by the seven leading American potash producers were well over any previous year, but those of imported potash were lower than last year. The deliveries were made in 45 states, the District of Columbia, Puerto Rico, Cuba, Hawaii, Canada, and a few other countries.

Deliveries for agricultural purposes in the Continental United States amounted to 1,731,088 tons K_2O, a 13% increase over last year. Canada received 73,023 tons of K_2O, an increase of 20%; Cuba 4,588 tons, a decrease of 74%; Puerto Rico, 16,501 tons, a decrease of 30%; Hawaii, 19,346 tons, an increase of 36%; and other countries, 2,304 tons, a decrease of 77% compared to last year.

Illinois was the leading state for deliveries, followed in order by Ohio, Georgia, Indiana, and Virginia. Deliveries do not necessarily correspond to consumption in a given state, it is added.

The 60% muriate of potash continued to be the principal grade, comprising 87% of the total agricultural potash delivered; sulphate of potash and sulphate of potash-magnesia together made up 6% of deliveries; 50% muriate of potash 6%; while manure salts dropped to less than 1%, reflecting the trend toward the use of more concentrated materials.

Deliveries of potash for chemical uses amounted to 98,780 tons K_2O, an increase of 22% over 1951-52. The 60% muriate grade made up 95% of chemical deliveries, and sulphate of potash 5%.

NAC PRESIDENTS

(Continued from Page 44)

threat to the continuance of the industry. Work is still in progress on this problem but much improvement is reported.

The solution of such problems as these and scores of others during my administration would not have been possible without the fine and conscientious work of the Association's

staff, the board of directors and the various committees who worked hard and long on their assignments. Also, great credit must be given to various member companies who loaned their experts without charge in many fields to assist the Association management.

Superimposed upon all of these and other normal Association activities were the requirements of the Korean emergency. Our Association management promptly committed the industry to a full program of cooperation with the Federal Government. Industry committees were set up to work with the various Government agencies and the Association members, directors and staff went all out to do their share in the emergency effort to meet the Government estimates required to maintain proper food production for ourselves and for our friendly allies.

The cooperative efforts of the Association's personnel to win the confidence and friendship of the various Government agencies' personnel during this trying period have proved to be of lasting value to both them and to us and were, I believe, one of the outstanding accomplishments of the Association during this period.

The problems carried over into the current administration and new ones which have been created since 1951 are being met with vigor and intelligence and there is every reason to believe that the present economic difficulties being encountered by the industry will be overcome and the upward course resumed.

* * *

ARTHUR W. MOHR
1951-1953

IT is difficult to forecast NACA problems and objectives for a future period as long as twenty years, but there are a number of subjects which I am sure will occupy the attention of the Association for several years.

A basic function of the Association which most certainly will continue through its life, is to foster educational programs on the value of industry's products throughout agriculture as a means of ever ex-

panding their uses. Another objective which will undoubtedly command a greater portion of the Association activities is that of public relations so that the average citizen will understand better what agricultural chemicals are doing to provide him a greater quantity of better quality foodstuffs at lower cost.

Work on the serious problem of product liability will be continued. Claims against the industry at the present time repreent a very substantial part of potential profits, and have been on the increase during recent years. It is felt that by organized effort of the Association, greater guidance and help may be made available to the membership in the matter of procedures to minimize liability and in the preparation of stronger defenses against liability suits. It is also believed that both federal and state legislation can be strengthened to provide industry with a more equitable protection against this type of loss.

Another problem which seems to be constantly with us is that of restrictive and undesirable state legislation. It seems that every year many new bills are introduced into state legislatures and often they present an unfair and serious threat to our business within the state. This will probably be an unending problem which will require constant, concerted effort on the part of the Association to protect industry.

An additional problem is that of working out better understandings with government regulatory bodies as to reasonable standards of toxicology for registration and marketing purposes and the establishment of proper residue tolerances.

These problems are not new and much work has been done on them up to the present time, but much more must be accomplished before they are satisfactorily resolved.★★

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Le Blanc to Henry Valve Co.

Henry Valve Company, Melrose Park, Illinois, has announced the appointment of Norman J. Le Blanc as representative for its line of ammonia valves used in soil fertilization. Mr. Le Blanc's territory includes Alabama, Arizona, Arkansas, Georgia, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas. He holds a B.S. degree in Agricultural Engineering from Louisiana State University, and was formerly chief inspector for the Louisiana State NH_3 Commission.

NEW HERBICIDE

(Continued from Page 57)

acre of phenyldimethylurea gave good control of Johnson grass.

Bermuda grass has been controlled by phenyldimethylurea. No Bermuda grass remained in plots at Garden City, Kansas 16 months after an April application of 60 pounds per acre of phenyldimethylurea. Bermuda grass was not eliminated by lower rates in this test. In Florida, an application of 30 pounds per acre had reduced the stand 80 per cent by the end of five months.

At San Juan, California, severe stunting, chlorosis, and leaf burn was evident on Canada thistles four months after spraying with

phenyldimethylurea at rates of 25 pounds or more per acre. Rainfall during the test period totaled 2 to 3 inches.

Soil Persistence

THE soil persistence of phenyldimethylurea in the Kansas tests was studied by chemical analysis and bioassay procedures. The chemical analytical method was essentially the same as that described for CMU, 3-(*p*-chlorophenyl)-1,1-dimethylurea, by Lowen and Baker* with the exception of the temperature and time of the coupling reaction used in the colorimetric determination of aniline, the hydrolysis product of phenyldimethylurea. Sixteen months after treatment, corn and sorghum grew normally in soil from plots receiving 25, 100, and 400 pounds per acre of phenyldimethylurea. Soybeans were injured only at the 400 pound level. Results of chemical analyses of soil samples from these plots 16 months after treatment appear in Table 2.

Samples from the Manhattan plots were taken about 10 months after an October treatment for bioassay and chemical determination of phenyldimethylurea residues. Corn, soybeans, and oats grew normally in soil taken from any depth (0-12") and at all dosage rates. Chemical soil residue determinations appear in Table 3.

Similar chemical and bioassay determinations of phenyldimethylurea soil residues from tests in Florida, Delaware, Louisiana, and Texas follow the same general pattern revealed in the Kansas studies.

Chemical determinations of phenyldimethylurea residues in soils from Delaware, Florida, and Louisiana field tests are given in Tables 4-6.

Relation of Rainfall to Herbicidal Activity

EXPERIMENTS were conducted in Florida and Texas to study the effect of time and amount of rainfall on phenyldimethylurea performance. Relatively low rates of phenyldimethylurea applied as pre-emergence treatments were used in order to get a rapid measure of the rain effect.

The Florida test was concerned chiefly with the relation of time of rainfall to phenyldimethylurea activity. Duplicate sets of plots were used. In one set, two inches of water was applied from overhead irrigation immediately following herbicide treatment with 1, 2, 4, and 6 pounds per acre of phenyldimethylurea. In the second set of plots, two inches of water was applied five days after herbicide treatment. When water was applied immediately after treatment, good weed control was obtained only at the higher rates. In the plot watered five days after treatment, initial control of weeds was obtained at all rates.

In Texas, the influence of time and amount of rainfall on phenyldimethylurea performance was studied using cotton as an indicator plant. Phenyldimethylurea was applied at rates of 1 and 2 pounds per acre as a pre-emergence treatment and water by overhead irrigation was applied at

*Analytical Chemistry, Vol. 24, page 1475, 1952.

1, 2, and 4 inches per acre immediately after the herbicide treatment. Two weeks later, the injury to cotton was moderate to extremely severe at all levels of water application.

In the second series of plots two inches of water was applied at three different times:

a) Immediately after treatment
b) One week after treatment
c) Two weeks after treatment

Injury to cotton from the phenyldimethylurea was more severe when water was applied immediately after chemical treatment. There was no effect on the cotton when no water was applied.★★

LEGISLATION

(*Continued from Page 55*)

all the growers of the state for all pesticides.

Under a variation of this type of legislation the state would purchase pesticides at wholesale and resell or apply them "at cost" for all the growers.

Proponents of these bills seek popular support for their measures by claiming that the growers would obtain materials at prices lower than the normal market. When pesticides are in short supply, the proponents also claim that these bills, if enacted, would assure plentiful supplies as well as low prices.

NAC strongly opposes all legislation to put the government in the business of producing or distributing pesticides. It believes that such legislation is against the best interests of the state, the growers, and the public generally, as well as against the best interests of the industry. In the few instances where government manufacture or distribution of pesticides has been tried, the programs have failed to work. The state can not afford to manufacture or stock the vast quantities of various pesticides which might be needed in any given state to take care of the possible needs of its growers.

Food and Drug Laws

SINCE the residue tolerance hearings of 1950 and the Delaney Committee hearings of 1951-1952, everyone in the agricultural chemical field knows that the Federal Food, Drug and Cosmetic Act has a definite impact on the introduction, sale and use of pesticides. Less generally realized is the fact that most states have some sort of food and drug law, corresponding generally to the Federal Food, Drug and Cosmetic Act of 1938, or its predecessor, the Pure Food and Drugs Law of 1906, and that the provisions of these laws could also affect the use of pesticides.

Accordingly, as various proposals are introduced each year to enact new food and drug laws or to amend existing ones, consideration must be given to provisions relating to pesticide residues and residue tolerances. The Association believes that these provisions should be in accord with those in the Federal Food, Drug and Cosmetic Act of 1938 so that wherever regulations or tolerances are issued under the Federal act they could be adopted under the state laws. The primary consideration is to assure that, until there is a clear-cut policy and program for controlling pesticide residues, the various states do not begin to enact laws or regulations which would be at variance with each other and thus interfere with the proper use of pest control materials.

The commotion caused by the Delaney Committee hearings has aroused the interest of the state legislatures in the problems related to the use of chemicals in foods as regards both intentional chemical additives and pesticide residues. A bill has already been introduced in one state aimed at regulating the use of chemical additives. We anticipate that similar bills will be introduced in many more states in forthcoming sessions. This type of legislation will demand considerable time and effort on the part of the Association within the next few years. The fact that some state legislation in this field appears inevitable makes it all the more desirable that some reasonable and practical Federal law, like the Miller Bill,

H. R. 4277, should be enacted to serve as a model and which could be adopted by the states without posing new and additional problems for the growers and the industry.

Restrictions on Use

WHILE these food and drug bills could limit the use of pesticides on food crops, more drastic threats to their continued use come in other forms.

The improper use of certain pesticides has unfortunately resulted in injury to humans, animals, growing crops and other property. In some instances, the reaction to these incidents has been extreme — legislative proposals to prohibit or drastically restrict the sale and use of various pesticides. These bills take several forms. Some of them would prohibit all sale and use of certain materials, others would restrict use to certain specified individuals, while still others require that anyone who wished to use the materials must first obtain a license and/or permit.

NAC recognizes that some control of the use of certain materials may be justified in the public interest. However, it believes that such legislation requires very careful consideration to be practicable and impose no more restriction upon the proper use of these materials than is absolutely necessary under the circumstances. Such bills should be designed to prevent improper use, but should not curtail unduly proper use and deprive the grower of the benefits of these important farm tools. Chemicals for the control of weeds may be classed among the greatest labor saving devices ever developed for the farmer. Yet, bills have been introduced in some states which would have prevented farmers of those states from using these herbicides.

NAC believes that bills which would require all users of pesticides to obtain licenses from the state are not necessary, contribute nothing to safe use or protection of the public, and serve to interfere with the proper use of agricultural chemicals.

It is NAC's firm belief that the problems of misuse are better

solved by *education* rather than by legislation.

Custom Applicator Acts

PROBLEMS associated with the use of certain agricultural chemicals and the rapid expansion in custom application prompted the Council of State Governments, in cooperation with other interested groups, to develop a model bill entitled "An Act Relating to Custom Application of Insecticides, Fungicides, and Herbicides," commonly called the "Model Custom Applicators Act."

This Act requires that persons engaged in the custom application of insecticides, fungicides and herbicides be licensed. A license is issued by the responsible state official after the applicant has shown that he possesses accurate knowledge concerning the use and application of pesticides and upon consideration of other pertinent factors such as financial responsibility. The licensee may be restricted to certain types of equipment or materials if he is found qualified to use only these types. For example, a custom applicator might be found qualified to use ground equipment but not aircraft, or to use insecticides and fungicides but not herbicides.

When states propose to regulate the custom applicators by law, NAC favors the adoption of this Model Bill.

Sales and Use Taxes

ALTHOUGH there has not been much specific legislation pertaining to sales taxes on agricultural chemicals in the past, it is expected that this type of legislation will become more common and more important as time goes on. The past legislative season saw more activity in this field than ever before.

Most states have already enacted or are considering the enactment of some form of sales and use tax law. Such laws often contain exemptions for certain commodities used in manufacturing operations or agriculture. There is no set pattern for such exemptions; it varies from state to state. Some states exempt supplies which farmers and growers use in the production of their crops, for example, gasoline for farm tractors, fertilizers and seeds. In some states agricultural insecticides, fungicides and herbicides are exempted.

NAC believes that agricultural chemicals are entitled to the same exemption as other essential farm supplies and attempts to have such exemptions written into laws.

As previously mentioned, not all legislation in the pesticide field falls into the aforementioned categories. Each year brings forth new and unusual proposals to regulate the pesticide manufacturer, the sale and use of his products, and even the user of them. While certain common features might be found in many of these bills, the full importance of them can be realized only when each is studied on an individual basis, in the light of all the circumstances surrounding its introduction. Space does not permit such a detailed discussion here.

The National Agricultural Chemicals Association believes that its legislative policy, outlined with respect to certain types of legislation above, is a constructive one and in the best interests of the industry, agriculture, and the public generally. With the continued support of its members and others in the industry, it will continue to serve these groups.★★

ACS MEETING

(*Continued from Page 65*)

tric furnace acid, and higher acidulation was required for the former. Acid concentration was more critical with the wet process acid than with electric furnace acid; 60% wet process acid highest conversion. Fluid times of the reacting acid-rock mixture were greatest with 60% wet process acid, and lowest with 70% electric furnace acid.

It is concluded that triple superphosphate made from wet process

phosphoric acid can be satisfactorily quick-cured in a Roto-Louvre dryer by proper choice of conditions of preparation of the fresh superphosphate.

"Characteristics of Insecticide-Fertilizer Mixtures" were outlined in a paper by F. B. Folckemer and E. S. Loeffler, Julius Hyman Div., Denver, Colo. That the incorporation of insecticides with commercial fertilizers presents certain practical problems, was pointed out by the authors. The methods of preparing insecticide-fertilizer mixtures include impregnation with insecticide solutions and dry blending with dust formulations. Good distribution of the insecticide in the mixture is important. Hazards involving the workers' health during manufacture must be considered, and precautions for reducing these hazards to a minimum must be taken. The effect of prolonged storage and transit on particle segregation of the mixtures, as a result of differences in particle size, requires investigation.

Analytical methods for insecticides must be proved applicable to fertilizer mixtures. Sampling techniques are especially important.

Stability of the insecticides in contact with the various fertilizer components is necessary to provide insecticidal effectiveness following prolonged storage. Alkaline components —i.e., ammonia and lime—tend to deactivate DDT and BHC but are not expected to affect such insecticides as aldrin, dieldrin, and chlordane. Acidic components—i.e., phosphoric and sulfuric acids—would not normally affect the insecticides at low concentrations, but may cause degradation on prolonged storage, particularly at elevated temperatures. Various metallic salts may catalyze breakdown of chlorinated insecticides.

Formulation problems will be solved as more experience is gained. Stability must be studied by practical tests, which will include the preparation of fertilizer-insecticide mixtures of all types and the determination of storage stability under extreme conditions of temperature, humidity, etc. The addition of an insecticidal material to a fertilizer must not make the mixture phytotoxic nor alter the growth response characteristics of the plant food materials.

Studies now in progress are expected to resolve many of these problems.

A new process of making nitric phosphates from phosphate rock, nitric acid, ammonia, potassium chloride and carbon dioxide was described in a paper by F. T. Neilsson, L. D. Yates, L. F. Roy and F. G. Heil, Tennessee Valley Authority, Wilson Dam, Ala. The process, demonstrated in a 4-ton-per-day pilot plant, differs from the nitric acid process described previously by TVA in that carbon dioxide is used to avoid the presence in the product of hygroscopic calcium nitrate. Gas from a scrubbing operation at the TVA ammonia plant was used as the source of carbon dioxide.

Minus 35-mesh phosphate rock was extracted continuously in three stages with 42% nitric acid at a nitric acid-calcium oxide mole ratio of 1.8 Ammonia was added to the slurry in three successive stages in an amount calculated to precipitate the phosphorus pentoxide as dicalcium phosphate and the fluorine as calcium fluoride. The presence of a small amount of gypsum or soluble sulfate in the slurry reduced the tendency of phosphorus pentoxide to revert to a citrate-insoluble form during ammoniation. After ammoniation, carbon dioxide and additional ammonia were added simultaneously in each of two stages to convert the calcium nitrate in the slurry to calcium carbonate and ammonium nitrate. The slurry was dried after the addition of potassium chloride to give a N-P_2O_5-K_2O fertilizer of 14-11-11 grade. Only about 1% of the phosphorus pentoxide in the final product was in a water-soluble form; at least 97% was in a citrate-soluble form.

A 12-12-12 grade fertilizer was made by replacing a small proportion of the nitric acid with sulfuric acid.

Agronomic tests showed that these products are effective fertilizers. Estimates indicate that the process is attractive economically.★★

Pridham Gets Colman Award

Dr. A. M. S. Pridham, professor of nursery crops production at Cornell University, Ithaca, N.Y.,

DR. A. M. S. PRIDHAM

was presented the Norman J. Colman Award at the 78th annual meeting of the American Association of Nurserymen at the Waldorf-Astoria Hotel, New York, in July. The Award is made each year in the interests of stimulating research work in the Land Grant Colleges and Universities and other research institutions of the nation. It is presented to the person judged to have made the outstanding contribution to the field of horticulture by publication during the previous year.

Dr. Pridham, a native of Canada, received his Ph.D. from Cornell and has been active in horticultural pursuits for years. He visited Australia and New Zealand in 1948 to do experimental work with herbicides for control of gorse and blackberry. Particular emphasis was placed on the development of low-volume spray equipment which made the application of herbicides a practical possibility at that time.

Recently, he has been doing test work on defoliation of nursery stock to make possible more efficient digging, grading and storage of roses and other deciduous ornamental plants.

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Moore to Sprout-Waldron

Appointment of A. Park Moore as sales representative for Sprout, Waldron & Company, Inc., in the Philadelphia-Wilmington area has been announced by Harold J. Alsted, vice-president in charge of sales.

NITROGEN

(*Continued from Page 121*)

from 1956 forward is indicated. Conclusions based on such projections carry considerable risk, however. In the first place, it assumes that agricultural, industrial and military demand will continue to climb at the the same astonishing rate. It further assumes that the expansion of production facilities will not accelerate.

Whether or not demand, particularly agricultural demand, (since this is the greatest part of the total) will continue to increase at the same rate for the next three or four years is a question open to considerable argument. It is also one which can be answered either way with equal justification. As has been stated, this rate of expanding demand is consistent with the expansion rate of the past 15 years. There is also ample opportunity for the sale of considerably more nitrogen-containing fertilizer. Only 26.5% of the total cropland and 5.3% of the plowable grasslands received any fertilizer in 1950. The trend is to higher analysis mixed goods and repeated studies have shown that for maximum per acre efficiency and economy nitrogen should be used at over twice the current rate.

On the other hand, political changes as to domestic farm policies and world-wide rehabilitation; the natural leveling off of demand; coupled with a somewhat deflationary outlook for general and farm income, lead many to feel that the expansion goal itself is optimistic and will result in overproduction of nitrogen.

It does not appear probable that domestic production facilities will expand at a faster rate than demand. The expansion is apparently proceeding now as rapidly as physically practicable—as indicated by unexpected delays and setbacks which account for the existing lag.

This, then, will leave it up to

imports to pick up the slack, if any. Imports for the 1952-53 season just ended will probably exceed the previous year by at least 50,000 tons; this total (340,000 tons) being the largest in recent years. On the basis of present plans and the increased availability of European nitrogen for dollars, it is believed that imports could ultimately be expanded to 500,000 tons of N without difficulty.

The question of whether the U.S. market will absorb this additional tonnage over and above the ever-increasing domestic production is debatable, as pointed out above, and will certainly require considerable readjustment in domestic distribution. Note should also be taken of the fact that at the end of the 1952-53 year for the first time since perhaps before the war, there are some unsold stocks of both imported and domestic nitrogen materials on hand. This carryover is quite small, to be sure, but nevertheless indicates that a saturation point can be reached on certain materials while there still exists a strong demand for others, depending chiefly on nitrogen content and unit cost.

However, barring some major economic readjustments, such as the depression of the thirties, and assuming that the use of nitrogen and fertilizer generally will continue to increase apace, it does not appear unreasonable to anticipate a place for an import volume of a half million tons of nitrogen which could be easily absorbed in the areas adjoining the coasts, leaving the domestic production to fulfill the tremendous potential of the inland states.★★

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INSECT SITUATION

(*Continued from Page* 103)

on field beans over the lower peninsula.

Rhode Island reports the European earwig as being more numerous than usual in Providence and Kent Counties. The insect is appearing in Delta County, Colorado in economic numbers. As far as known this is the first report of the insect from western Colorada. At Twin Falls, Idaho the insect was in whorls of sweet corn and is constantly spreading to new communities in Utah.

Screw-worms in S. Dakota

SCREW worms were taken from cattle in Sandley, County, South Dakota, August 1. Cases had previously been reported from Nebraska in early July. The first report of the season from Iowa was of a case fatal to a dog in Polk County.

Stable flies were on the increase in Iowa. They were also reported as being very numerous in South Dakota. Horn flies were on the increase in Texas and Oklahoma as were horse flies in the latter State.

Cotton Insects

BOLL weevil continued to be the number one cotton pest in early August. In North Carolina, it was abundant in some counties and in South Carolina, migration was underway in nearly all Coastal Plain and Sand Hill Counties. Square infestation continued high in Georgia, but squares were scarce and picking was

increase was rapid as was the situation in eastern Oklahoma.

Bollworms were on the increase in North Carolina, South Carolina, Georgia, Louisiana, North Texas, eastern Oklahoma, Arizona and Riverside County, California.

By the middle of August, cotton leafworm had appeared in most of the cotton-growing states. The first of the year for Oklahoma was found in Harmon County, July 28, and during the next three weeks, a light general infestation developed. Texas reported light damage from this insect, with pupation under way in most sections August 15. Heavy moth flights were recorded in Rapides, Avoyelles and Natchitoches Parishes, La. the second week of the month.

The pink bollworm, which last year for the first time caused considerable economic damage in Texas, is being found in fewer numbers than last season. Pink bollworms per bushel of gin trash in several Texas counties found this year as compared to 1952 follow: (1953 figure given first) Bee, 166 to 1,384; Kleberg, 49 to 6,156; Nueces, 153 to 5,020; Karnes, 166 to 590; Live Oak, 47 to 3,128 and San Patricio, 2,830 to 3,485. Goliad County showed an increase, 1,561 in 1953 compared to 318 in 1952.

Cereal and Forage Insects

GRASSHOPPERS were the principal cereal and forage pest during early August. Damage during the period was reported from Maryland, Delaware, Pennsylvania, Illinois, Wisconsin, Missouri, Iowa, South Dakota, Texas and Utah. In New Mexico, grasshoppers were the most pressing insect problem. Large scale control programs were conducted on range and public lands in both Colorado and New Mexico during July.

The fall armyworm was also causing damage in several states. In Maryland corn was damaged, in South Carolina, lawns, corn and grain sorghums, in Georgia pasture grasses. Heavy infestations were in young corn and Sudan grass in Mississippi, in late corn in Tennessee, in grass crops in east Texas, in lawns, peanuts and grain sorghums in south central Oklahoma. Arkansas, Arizona, Illinois, Missouri and Iowa also reported infestations.

Dutch elm disease, which is spread by certain bark beetles, has caused loss of more trees in Bergen Essex, Passaic and Morris Counties, New Jersey than in recent years. Second generation elm leaf beetles have caused severe damage in Sacramento and San Joaquin Valleys of California. First generation beetles caused serious damage in Malheur County, Oregon and heavy feeding occurred over most of Rhode Island.★★

LAWN INSECTS

(*Continued from Page 49*)

to take advantage of the new label acceptance and make large scale applications of dieldrin to lawns, commercial applications under an experimental label have shown that the same results can be expected wherever lawns are under attack.

Markets Available

MARKETING opportunities are offered the formulator and custom operator in a number of directions in the control of these lawn pests. One obvious potentiality is the home owner whose lawn is being attacked. In wide areas of the south, particularly, homeowners are seeing their hard work and financial investment being steadily destroyed and will welcome any reasonable method of stopping the progress of the pests.

Custom operators have had success in arranging cooperative programs of turf pest control by treating all the yards in a neighborhood at the same time, thus preventing possible escape of the insects to untreated areas near by. Programs of this nature provide a longer lasting control, since there is also less likelihood of a treated lawn's becoming reinfested by chinch bugs migrating from a neighboring untreated lawn.

Another large potential is in the nursery field where business investments are being undermined by the presence of chinch bugs, grubs and ants. Greenhouse soils are often under attack, also, and their owners have shown keen interest in methods of

control which may be employed in keeping with good cultural practices.

Certainly not to be overlooked in considering markets for turf-insect control materials, are the thousands of acres of well-kept golf courses being attacked by one or more of these lawn-wreckers. It would appear to be good business if local formulators and custom sprayers should investigate the potentialities of treating golf areas in their localities. The same is true of public parks and athletic fields where both pride and finances make necessary some kind of action to halt lawn-killing bugs.

So far as effective dosages are concerned, experience has shown that a five percent granular dieldrin formulation, applied to the soil at the rate of one pound per 725 square feet, (in Florida, 1 lb. per 100 sq. ft.) gives good results. In granular form, the toxicant may be applied alone, or, as is done frequently to save time and labor, it may be applied at the same time fertilizer is distributed to lawn area.

However the method, the fact remains that there is great need for control of turf insects in many parts of the country. Experiment station work has shown that it can be done and now this knowledge needs to be put into commercial action without delay!★★

TABLE I

Treatments:

Formulation	Rate per 100 feet	Lbs. actual dieldrin per acre
1. 2% granular	1 pound	8.7
2. 5% granular	1 pound	21.7
3. 10% granular	1 pound	43.5
4. 15% emulsion	2 oz in 2 gal H_2O	10.0
5. 15% emulsion	4 oz in 2 gal H_2O	20.0
6. Check		

TABLE II

July 3rd Reading

Replications

	A	B	C	Total
Treatment	Total	Total	Total	Total
1. 2% granular	1	7	1	9
2. 5% granular	2	0	1	3
3. 10% granular	0	2	1	3
4. 2 oz. emulsion	2	0	0	2
5. 4 oz. emulsion	0	0	1	1
6. Check	22	7	1	30
Total	27	16	5	48

July 17th Reading

Treatment	W.	N.W.		W.	N.W.		W.	N.W.		W.	N.W.	
1. 2% granular	1	0	1	2	11*	13	0	0	0	3	11	14
2. 5% granular	1	1	2	1	1	2	0	1	1	2	3	5
3. 10% granular	2	3	5	0	2	2	0	0	0	2	5	7
4. 2 oz. emulsion	1	4	5	0	0	0	1	1	2	2	5	7
5. 4 oz. emulsion	4	1	5	4	1	5	2	11*	13	10	13	23
6. Check	41	28	69	12	6	18	0	14	14	53	48	101

*—Migration from check — all winged individuals.
W.—Watered.
N.W.—Not Watered.
All counts were made from 1 sq. ft. area. Method of counting was by flooding and counting individuals coming to surface.

Classified ADVERTISING

Rates for classified advertisements are ten cents per word, $2.00 minimum, except those of individuals seeking employment, where the rate is five cents per word, $1.00 minimum. Address all replies to Classified Advertisements with Box Number, care of AGRICULTURAL CHEMICALS, 175 Fifth Ave., New York 10. Closing date: 25th of preceding month.

Situations Wanted:

CONSTRUCTION & MANAGEMENT EXPERT: Long experience construction, management, operation of insecticide, fungicide, herbicide plants in wide areas of U. S. and Mexico. Handled all purchasing, formulating, registering, sales; supervised large scale testing of materials in field. Broad personal contact with commercial, state, Federal entomologists, plant pathologists, agronomists in U. S. & Mexico. Available now. Address Box No. 774, c/o Agricultural Chemicals.

COAST SALES: Experienced salesman with twenty years in both agricultural and household insecticides and related products is available to cover west coast for manufacturer of raw materials or finished products. Can operate sales office and attend to all details. Not interested in introducing new products or straight commission deals. For further details address Box No. 775, c/o Agricultural Chemicals.

Positions Available:

GROWING AGRICULTURAL CHEMICAL RESEARCH SECTION HAS THE FOLLOWING POSITIONS OPEN:

Group Leader

Technical Service and Formulation Group: Chemical or Biological education with considerable experience in the preparation of agricultural formulations and knowledge of agricultural chemical field required.

Field Research

Position requires advanced degree and practical experience in Entomology, Physiology or Pathology, and familiarity with all phases of agriculture. Possibility of selection as group leader in expanding group.

ADDRESS REPLIES TO:
Supervisor of Agricultural Chemical Research
Research & Development Department
Pittsburgh Coke & Chemical Co.
Pittsburgh 25, Pa.

SALESMAN: Challenging opportunity to develop into responsible position with small, growing manufacturer of nationally advertised line of packaged garden chemicals. Excellent trade acceptance. Sell to garden supply trade primarily in Midwest. Man selected will be company's first full time salesman and will grow with company. Chicago headquarters. Salary, expenses, bonus. Please write fully including education, experience, references, age, photograph, and present salary. Address Box No. 776 c/o Agricultural Chemicals.

For Sale:

FOR SALE: 24" dia x 15" deep self discharging type centrifugal. W. W. Hartman, 1230 E. 109th St., Los Angeles, California.

STEEL TANKS FOR SALE: Dished heads—all welded. Excellent for storing liquid fertilizer, chemicals, etc. At Marion, Ind.—(4) 12,700 gal., (2) 11,000 gal., (2) 10,500 gal. At Norfolk, Va.—(3) 5,800 gal. At Tonawanda, N. Y.—(5) 7,000 gal. At Reading, Pa.—(9) 4,600 gal., (5) 4,300 gal., (2) 3,800 gal. Perry Equipment Corp., 1428 N. 6th Street, Phila. 22, Pa.

FERTILIZER FOR SALE: Mixed high analysis fertilizer can be manufactured under private label for you. Also available Muriate of Potash—Ammonium Nitrate—Triple Superphosphate. Address Box No. 777 c/o Agricultural Chemicals.

Miscellaneous:

WANTED: Exclusive distributors for Liquid Nitrogen Fertilizer. Territories open. Address Box No. 778, c/o Agricultural Chemicals.

WANTED TO BUY: 4,000 lbs. Technical DDT, Flake or powder, Setting Pt. 89°C. Minimum. Containers or bags must be in good condition. Quote price F.O.B. origin. Address Box No. 779, c/o Agricultural Chemicals.

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Chase Advances J. R. Peat

J. R. Peat, who has been connected with the St. Louis sales department of the Chase Bag Company as special representative, has been made sales manager of the St. Louis Branch, effective August first, it has been announced by W. N. Brock, general sales manager.

A graduate of the United States Naval Academy, Mr. Peat served as a lieutenant aboard submarines until 1948, when he joined Chase Bag as a salesman in St. Louis. He was recalled to active duty in 1951 and after a year at New London, Conn., was released in 1952.

•

Tower Returns to Westvaco

Ray C. Tower has returned to Westvaco Chemical Division, Food Machinery & Chemical Corporation, New York, after a two-year tour of active duty with the U. S. Navy and has been named assistant divisional manager, Phosphate Sales, with headquarters at New York.

In his new position, Mr. Tower succeeds John Peterson who has been appointed district sales manager at Chicago. Mr. Peterson was advanced to the position of assistant divisional sales manager at New York in August 1951 after serving for two years as a sales representative in the Intermountain territory with headquarters at Pocatello, Idaho.

•

Ferd Wieder, Stauffer, Dies

Ferd W. Wieder, 59, vice-president of Stauffer Chemical Company, in charge of the firm's San Francisco Division, died August 11 in San Francisco. His death resulted from a stroke, company officials said.

Mr. Wieder had been a Stauffer vice-president for the past twenty years. He joined the firm in 1918 as a plant worker, later joined the technical staff in the laboratory and eventually became a member of the sales staff.

He was educated at the University of California, Berkeley, and joined Stauffer in that city. A native of the west coast area, he was prominent in business and social affairs in San Francisco.

INDUSTRY MEETING CALENDAR

Association of Official Agricultural Chemists, Shoreham Hotel, Washington, D. C., October 12, 13 & 14.

Association of American Feed Control Officials, Shoreham Hotel, Washington, D. C., October 14 & 15.

Association of American Fertilizer Control Officials, Shoreham Hotel, Washington, D. C., October 16.

Association of Economic Poisons Control Officials, Shoreham Hotel, Washington, D. C., October 17.

Entomological Society of British Columbia and Entomological Society of Canada, Empress Hotel, Victoria, B. C., Oct. 19-21.

First International Congress for Plant-Protection, University of Naples, Portici, October 19-23.

Fertilizer Safety Section, National Safety Council, Chicago, Ill., October 21.

Second Annual Meeting of the Entomological Society of Canada jointly with the Entomological Society of Quebec, Quebec City, Oct. 29-31.

Thirtieth Annual Convention, California Fertilizer Association, Carmel-By-The-Sea, Calif., November 9 & 10.

Sixth Annual Pesticide Application Equipment Conference jointly with 15th Annual New York State Insecticide-Fungicide Conference, Bibbins Hall, GLF, Ithaca, N. Y., November 10-12.

National Fertilizer Association, annual fall meeting, Biltmore Hotel, Atlanta, Ga., November 16-18.

Chemical Specialties Manufacturers' Association, Inc., 40th annual meeting, Mayflower Hotel, Washington, D. C., December 6-8.

National and North Central Weed Control Conferences, Hotel Muehlebach, Kansas City, Mo., December 8-10.

Entomological Society of America, Biltmore Hotel, Los Angeles, Calif., December 7-10.

Illinois Custom Spray Operators' Training School, University of Illinois, Urbana, January 21-22, 1954.

Index to ADVERTISERS

(The Advertisers' Index has been checked carefully but no responsibility can be assumed for any omission)

Tale Ends

QUESTIONNAIRES have been sent to the fertilizer industry by the Fertilizer Section of the National Safety Council, in order to establish a broader base line on the industry's safety on a national scale. We urge every plant manager or other official in plants everywhere to cooperate in this project. The questions asked are not difficult to answer and we hope they'll receive prompt attention! As noted on the questionnaire, it should be returned to the Fertilizer Section, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

•

Chemical Corporation of Colorado, Denver, was to go into hands of a receiver August 31, by order of the U. S. District Court in Denver. The action was brought to a head by the Denver Amarillo Express Co., a creditor, which petitioned that the chemical company be adjudicated a bankrupt and that a receiver be appointed to handle the affairs and assets of the firm. The company has been in financial straits for the past two years, following a fire and declining profit margins on insecticides.

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Does a householder have the right to bury garbage in his back yard, contrary to local rules, even though he can make use of the material as an organic fertilizer? The answer is "no", according to Jose Schorr, in an article appearing recently in the *Saturday Evening Post*.

In his story, Mr. Schorr told of a garden-planter who was brought into court for "dumping, keeping and storing garbage," which was against the law. Arguing that he was enriching his soil "by the organic-fertilizer technique," the accused was assessed a small fine. He thereupon appealed to a higher court, which also decided against him. The latter opined, "If we allow this, there are some less learned than the defendant in the subject matter of organic fertilizer who would attempt to emulate him, with disastrous results to the pure air of our village. . . ."

Fine: $15.

Someone should tell our gardening friend about the nice new fertilizer products being packaged and marketed especially for people like himself. They're richer in plant food, easier to apply (not necessary to dig a hole) and the neighbors won't complain.

The newest, best multiwall bags for valve-packing your fertilizer . . .

Bemis B-FLEX Valve Bags!

You should switch to Bemis B-FLEX promptly because . . .

1. LOWER BAG COSTS. You'll save up to $4 per thousand compared with conventional inner-sleeve valve bags.

2. LOWER PRODUCTION COSTS. Faster handling on your packing machines.

3. FASTER PACKING. Are jam-ups a problem? Not with Bemis B-FLEX. No flapping inner-sleeve to slow down material flow.

4. UNIFORM WEIGHTS. You can hit your weights "right on the button." Stop over-packing.

5. CLEAN PACKAGE. Minimum sifting.

6. BETTER CUSTOMER SATISFACTION. No loose, torn sleeves to get into the farmer's drill.

And, of course, you get the added benefit of Bemis' crisp, bright, multi-color printing — the finest printing your brand can have on multiwall bags.

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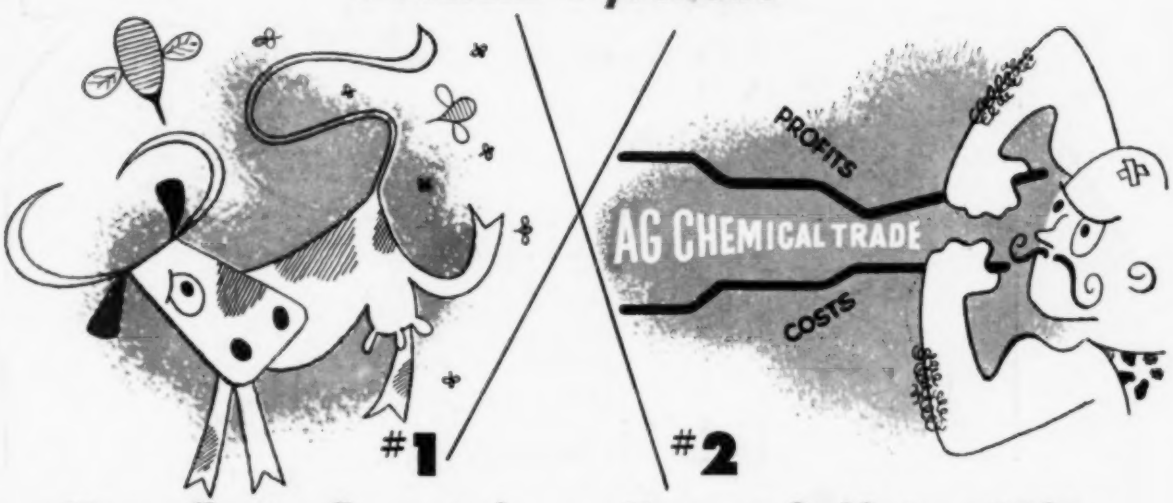

More effective fly control

The need is for more effective fly control, following the development of resistant insects and lower tolerances of toxicity. Pyrenone fulfills this need because it has fast knockdown and kill, has such low toxicity that it can be used even on dairy animals, and it is adaptable to a wide range of application methods.

For conventional spraying and fogging devices, Pyrenone can be formulated in a variety of combinations to best fit the requirements.

The automatic spraying device, rapidly growing as a popular fly control measure on dairy and beef animals, provides a laborsaving method of application.

Still newer is a *special cow aerosol bomb* which is coming into prominence in some areas and may rapidly spread across the country.

In all three methods, Pyrenone insecticides are winning preference for dependability, efficiency and customer satisfaction. Your customers can rely on Pyrenone-base insecticides.

More profitable insecticides

Insecticide formulators, distributors and dealers are being squeezed out of their profits by "bulk chemical" concepts of selling.

With Pyrenone-based insecticides, the trade has the opportunity for greater profit. Pyrenone's special characteristics give it the *sales appeal of a "specialty",* yet its wide usage creates *volume sales.*

If your profits are suffering from lack of proper selling effort on *more profitable items,* turn your attention to *Pyrenone products.*

You'll find a wide range of products based on Pyrenone for most pest control problems — each of them a leader in its field both for performance as an insecticide, and for its price stability as a commodity for the trade.

Join the swing to Pyrenone for more *effective* insecticides, more *satisfied* customers and more *profitable* sales.

Pyrenone means *more* more-profitable sales.

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